

THE BRITTLE THREAD OF LIFE



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A CANDIDATE FOR LONG LIFE.

THE BRITTLE THREAD OF LIFE.

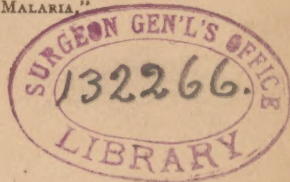
"How brittle, yet how precious to each of us, the thread of life."

UNFOLDING THE TRUE RULES OF LIFE AND ACTION BY WHICH TO NURTURE AND
STRENGTHEN, TO GUARD AND LENGTHEN, THIS VITAL
CORD, THIS BRITTLE THREAD.

BY
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ENED OR AFFLICTED WITH BRIGHT'S DISEASE OUGHT TO LIVE," "CON-
STIPATION RELIEVED WITHOUT THE USE OF DRUGS," "MALARIA,"
"VACCINATION," Etc., Etc.

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DEDICATION.

THIS VOLUME IS RESPECTFULLY DEDICATED
TO THE OLD MEN OF THE WORLD,
WHOSE VERY AGE ENTITLES THEM TO RESPECT, SINCE IT IS CONCLUSIVE
PROOF THAT THEY HAVE LIVED CORRECT LIVES.
IN AN ESPECIAL MANNER IT IS INSCRIBED TO THOSE AGED GENTLEMEN
WHO HAVE KINDLY ASSISTED ME, BY THEIR EXPERIENCE,
IN ITS PREPARATION.

TO DR. WALTER F. ATLEE,
MY FORMER PRECEPTOR AND GOOD FRIEND, WHOSE KIND AND
INTERESTED SERVICES HAVE DONE SO MUCH TO
ENABLE ME TO PREPARE THIS WORK;

TO DR. D. G. BRINTON,
WHO HAS ENCOURAGED ME TO GIVE IT PUBLICITY; AND

TO ONE NEAR AND DEAR TO ME,
TO WHOM, FIRST OF ALL, I MUST ATTRIBUTE THE PREPARATION OF THIS
BOOK, AND TO WHOM ALL WHO MAY DERIVE ANY BENEFIT
FROM ITS PERUSAL WILL OWE A DEBT OF
GRATITUDE, I DEDICATE IT.

PREFACE.

The desire for long and healthy life is inherent in every one. It is, as it were, a legacy bequeathed from father to son, and is as strong to-day in the heart of man as it was in the beginning of time. This fact needs no discussion, simply because it is a fact, familiar to all. No sane man ever really desired not to live and not to enjoy health. But a fact not so familiar to every one, is the truth, that very few persons live as long as they should, neither do they enjoy that measure of health which they ought to. That is to say, the majority of human beings die unnecessarily soon; their lives might be much longer; they suffer needlessly from disease; their health might be much better. The duration of the life of a man is much more under his own control than the large majority of men imagine. There are many good, pious persons who would be horrified at the slightest suspicion that they are *fatalists*, yet who believe that every human being has a certain definite time to live, at the end of which period he must die. This savors very much of fatalism, and is at the same time a very erroneous and dangerous belief. Rather let us agree with Hufeland (about whom I will tell you much in the body of this work), that each and every human

organism inherits from its parentage a certain amount of vital or life force, and that when this power is exhausted death will ensue ; bearing in mind the pregnant truth that man has it in his power to waste or save this inherited vital force, just as he can waste or save inherited pecuniary wealth, and that upon this very liberalism or conservatism will depend long life or premature death, will rest good, robust health or sickness and suffering. Every act of life, every duty performed by man, entails, as a result of its performance, the consumption of a certain amount of this vital inheritance. Every unnecessary exertion or effort put forth in the performance of these duties necessitates the consumption of an unnecessary amount of this vital force, so that it is prematurely consumed. The majority of persons exhaust their stock of vital force unnecessarily early, because they do not know how to preserve it; they are ignorant of how they ought to live. If you endeavor to make human nature conform to strict rules, you make life irksome ; they feel under continual restraint, they fret and fume, and soon throw off the yoke, when a reckless life ensues. There are, no doubt, very many persons who really desire to live properly; who are anxious to prolong their lives to the utmost possible limit; yet who either know not, or entertain erroneous ideas concerning the way they ought to live. For such persons this work has been conceived. In order to make its precepts possible of achievement, I shall make

them very easy and very simple, such as can be adhered to by every one without depriving themselves of one iota of rational enjoyment. Yet at the same time they will be sufficiently complete and comprehensive to insure long life as the reward of their observance. Their devotees need not be slaves to hygiene, but, on the contrary, will soon find that greater health and happiness will be vouchsafed to them, and will recognize the rules laid down as the rules of *true life*. They will be simple indeed, and intelligible; comprehensible even to the least professional mind, since all technical language will be avoided, and only plain, common-sense English used. Intelligent and intelligible reasons for all the rules will be given, so that no one need obey blindly, while all can clearly understand why and wherefore they are recommended to do this or that. Trusting that I may carry health and comfort to many well-meaning but hitherto uninformed persons, I venture on my work.

JOSEPH F. EDWARDS.

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CHAPTER I.

INTRODUCTORY—THE HUMAN BODY—WHAT IS LIFE? AND GENERAL RULES FOR ITS PROLONGATION.

The human body might be not inaptly compared, for the sake of familiar illustration, to our own United States. There are found in the body many different systems, just as we have the different States. Thus we have the muscular system, the nervous system, the circulatory system, the absorbent system, the secretory system, and so on. These various systems have each their own laws for their guidance, just as each of our States has its own constitution. The welfare and politically healthy life of the whole country depends upon the integrity and faithful observance of the laws of each State. So our own welfare and the physically healthy life of our bodies depends upon the proper action and performance of duty of the various systems within us. The various States are under the control and direction of a central government, whose administration, be it good or bad, will to a certain extent affect the welfare of each individual State, beneficially or injuriously. So our various systems are under the control of a central power, so to speak—the vital power, or the property which endows us with life (whose executive is the intel-

ligence), and which enables us to direct the actions of our bodies, either for their general good or their general woe.

If one of our States is corrupt, and sends to the national representation poor nourishment from which to form its life, in the shape of bad and depraved legislators, they not only do harm to themselves and their own State, but by interfering with and contaminating the other representatives they injure the country at large. So with the human system. If we neglect, abuse and deprave one particular system, unfortunately, the evil effects of this abuse do not remain confined to where they have originated, but, according to the laws of nature, which make each portion of the body dependent upon the others, they spread abroad, and, contaminating every other system, interfere with the healthy performance of duty on their part.

I have used the above illustration to enforce the statement I am now going to make—

That a healthy and proper performance of ALL the functions of the body is necessary in order that we should enjoy perfect health and *very great* longevity. If one organ or set of organs act imperfectly, they will not only produce their own particular effects in causing disease and shortening life, but, by their interference with the proper duty of other and remote organs, will cause disease of them, and this second set, acting injuriously on a third, will disease them, and so on, until the whole system becomes involved in this imperfect performance of duty, and premature decay and early death ensue. Just here it will be pertinent to anticipate what I will have to say frequently throughout

this book, and to assure you, beyond any question of doubt, that a man who may have some disordered or diseased organ or set of organs, can yet live to positive old age. He need not and must not despair of long life. The absolutely and typically healthy man is a great rarity (more rare than Christian charity), yet many persons live to old age. But if you have any imperfectly acting organs, a diseased heart, a disordered kidney, a weak stomach, or an unhealthy liver, then indeed must you be doubly careful. If such a defect does exist within you, then, by following the advice of this work you may and can live just as long as the sound man who does not take care of himself; because by so doing you reduce to the minimum the amount of labor to be performed by this weak organ, you conserve to the utmost the amount of vital power possessed by it, and enable *it* to work, and your body to live, much longer than if you had neglected these precautions. This is common sense.

Let us now ask, "What is *Life*?" In a practical work like this it would be out of place and unnecessary to enter into philosophical dissertations as to the nature of this much mooted question. For our purpose it will be sufficient to state that *Life* is a *peculiar, invisible and undefinable agency, a gift of the Almighty Creator, which has the power of starting and maintaining in motion for a certain period the various functions of the body, whose proper action constitutes the healthy existence of the animal.*

Dr. Hufeland, in his valuable work,* asserts his belief in the fact, that a certain amount of vital power,

* "The Art of Prolonging Life," written in the last century.

of this invisible agency, is born with each one of us, and that so long as its supply lasts, so long will we live, and when it becomes exhausted we will die. It must be evident to every one that the more carefully we spend this amount of force the longer it will last, and that the spendthrift will soon exhaust his vital wealth, and become, prematurely, a physical bankrupt. In order that this power may be economized, it is evidently necessary that we should know how to treat our different organs when they are performing their various functions, in order that they may do their duty with as little expenditure of this vital force as possible. If a young man inherits a large fortune, and recklessly spends it, he will soon come to want; but if he realizes his error before it is all gone, and reforms his ways, so as to become economical and sparing, he may have enough left to keep him in comfort for many years. So with this vital force. If any one of my readers has been leading a reckless life, wasting his vital energies, and unduly taxing his vital strength, let him realize, when he reads this book, that grand old saying, "*It is never too late to mend.*" By economizing and carefully spending his remaining vital force, he may prolong his life for many years. Just as the financial spendthrift may, by judicious and careful investment of his remaining capital, derive a good interest on his money, and ultimately repair, to a certain extent, his shattered fortune; so the physical scapegrace can, by a judicious use (or investment) of the remaining vigor of his various organs and parts, greatly repair their wasted energy and power, while if he cannot absolutely add to his original inheritance of vital force, he can at

least so save and regulate its manifestations as to make it last him many years longer than it would have done had he continued his reckless and imprudent life. I cannot better illustrate the fact, that after many years of reckless living a man can, by prudence and care, still attain great longevity in comfort and ease, and can perform much labor, than by quoting from Dr. Hufeland's work (already referred to) the famous case of the Italian, Cornaro. This case will also illustrate in a most marked manner how remarkably careful we must be in the treatment of our various organs, in order that they may not rebel and give us trouble. You will say that this is an exceptional case, and so it is, in so far as the *very* advanced age which Cornaro reached is concerned; but I could tell you of many cases, where a ripe old age (though less than his) has been reached through the medium of a careful, prudent life, even when a reckless course had been pursued for many years. And also remember, *that what has once been done, can always be done again.* Dr. Hufeland says: "Cornaro, who, by the strictest and simplest regimen, and an unexampled perseverance in his plan, attained happily to a great age, which rewarded him richly for his self denial and gave an instructive lesson to posterity, was an Italian. One cannot read the history of the life and abstinence of this veteran of eighty-three, and hear how he praises that serenity and contentment for which he was indebted to his mode of living, without participating in his happiness and his cheerful sensations. Till the fortieth year of his age he had led a life of dissipation; had always been subject to colics, pains in his limbs and a fever; and was so far

reduced by the last, that his physicians assured him he could not live above two months, that all medicine would be useless, and that the only thing which could be recommended for him was a spare diet. Having followed this advice, he found, after some days, that he was much better, and at the end of a few years his health was not only perfectly reëstablished, but he became sounder than ever he had been before. He resolved, therefore, to restrain himself more and more, and to use nothing except what was absolutely necessary for subsistence. For sixty whole years he took no more than twelve ounces of food, everything included, and thirteen ounces of drink, daily. He avoided also violent heat and cold, as well as passion, and by this uniform regimen, he kept not only his body, but also his mind, in such a state of equality, that nothing was able to derange them. When at a great age he lost an important lawsuit; and though this disappointment hurried two of his brothers to the grave, he remained perfectly sound and resigned. He was once thrown from a carriage and trod under the feet of the horses, so that an arm and foot were dislocated, but he caused them to be reduced, and, without the use of any medicine, was soon restored to his former condition. But what is most worthy of remark, and what proves how dangerous the smallest deviation from long custom may be, is what follows. When he was eighty years of age, his friends prevailed upon him, as his body now required more nourishment, to make a little addition to his food. Though well aware that with the general decay of strength the powers of digestion decrease also, and that in old age one ought rather to lessen than increase the quantity

of nourishment, he gave way to their request, and raised his food to fourteen and his drink to sixteen ounces. *'Scarcely,'* says he, *'had I continued this mode of living ten days, when I began, instead of being cheerful and lively, as before, to become uneasy and dejected, a burden to myself and to others. On the twelfth day I was seized with a pain in my side, which lasted twenty-four hours, and this was followed by a fever, which continued with so much violence for thirty-five days that my life was despaired of. But, by the blessing of God, and my former regimen, I recovered, and now, in my eighty-third year, I enjoy a happy state, both of body and mind. I can mount my horse without assistance; I climb steep hills, and I have lately written a play, abounding in innocent wit and humor. When I return home from private company or the Senate, I find eleven grand-children, whose education, amusements and songs are the delight of my old age. I often sing myself, along with them, for my voice is now clearer and stronger than it ever was in my youth; and I am a stranger to those peevish and morose humors which fall so often to the lot of old age.'* In this happy disposition he attained to his hundredth year." In a foot-note Dr. Hufeland says: "I would earnestly advise people, before they begin this regimen in the strictest sense, to consult their physician, for abstinence, carried so far, will not be salutary to every one."

This is truly a remarkable case, and has been recorded here with a purpose. I am anxious to do my share of good in the world, to benefit my fellow men to the best of my ability. Such has been my object in preparing this work; and in furtherance of this desire

I have quoted the case of Cornaro, because, in matters of health, as in matters of religion, there are many men living in a condition of despair. For many years they have neglected and abused the health born in them, and when, reaching the age of reason, they realize their past folly, a feeling of despair, akin to that of the lifelong sinner at the hour of death, takes possession of them, and they imagine that, having so long neglected to live as they ought, there is no hope for them, that they are doomed to an early death; when, in a spirit of recklessness, born of despair, they continue to gratify their depraved and vitiated passions and inclinations, and live as they have in the past, realizing at the same time that they are doing wrong, but erroneously believing that they cannot remedy the, to them, irreparable results of the unfortunate past. This is an erroneous and fatal view. It is to antidote this deadly despair, and to inspire new hope in these despondent hearts, that I have quoted this celebrated case. It will inspire new courage in them and force them to realize that they have yet the opportunity to live long and honorable lives. If this one point is achieved by my book, I will have been repaid for the many hours given to its preparation. Just here, in the beginning, I will make an explanatory apology for what may seem like dogmatism throughout this work. Such a book must necessarily be, to a certain extent, dogmatic, since there are certain rules of life, just as there are rules of grammar, arithmetic or religion, and such rules must be enunciated positively, therefore there must be a certain air of dogmatism about them. Of course, there are some exceptions to the rules I will formulate, since there is no

rule so absolute as to present no exceptions, but I will in each case make mention of the exceptions. With these general remarks, let us now go more minutely into the business of this chapter, under its three headings.

I. THE HUMAN BODY.—The body of man, considered from a physical standpoint, is a *marvelous machine*. Inscrutably wonderful in its origin and formation, divinely mysterious in its functions, and immeasurably potent in its possibilities, it is nevertheless, in reality, a machine. Bear in mind that I am not including the soul when I call the human body a machine; we are now considering the corporeal, to the exclusion of the divinely spiritual portion of man, with which we will have to do only incidentally. I wish this point to be clearly understood, since, although materialism and religion are perfectly compatible beliefs, yet I do not deem it proper to discuss them in a work like the present, and I do not wish to be misunderstood, when advancing such materialistic views as I shall; I intend them only to apply to the BODY and not the SOUL of man; so that we will leave the spiritual portion of mankind out of consideration.

No doubt I will be severely criticised by some persons, and will be accused of a want of proper appreciation of the wonderfully divine functions of the human body, when I call this body a machine. The overly sensitive feelings of some will be wounded by this application of a word so common, so mundane, and even, maybe, so vulgar, as *machine*, to an organization so delicate, so refined, so divine in its origin, so god-like, so wonderful, so superhuman, and so incomprehensible in its mani-

festations, as the human body. Yet the comparison is not so inapt nor so overdrawn as would at first appear. In his Unabridged Dictionary Webster defines the word *machine* as follows: "In general, any body or assemblage of bodies used to transmit and modify force and motion, as a lever, pulley, wedge, screw, etc.; especially a construction, more or less complex, consisting of a combination of moving parts, or simple mechanical elements, as wheels, levers, cams, etc., with their supports and connecting framework, calculated to receive force and motion from a prime-mover or from another machine, and transmit, modify and apply them to the production of some desired mechanical effect or work, as weaving by a loom or the excitation of electricity by an electrical machine." "3d. Any instrument or organization by which power is applied and made effective, or a desired effect produced; *the whole complex system by which any organization or institution exists or is carried on.*" In his Medical Dictionary, Dunglison says: "The human body is the collection of organs which compose the frame." Is not the human frame a collection of organs and parts intended to receive, modify and transmit motion and force? Is it not an "Instrument by which power is applied and made effective, or a desired effect produced?" Does not the human machine receive vital force from its maker, and does it not modify, regulate and transmit this force so as to accomplish a certain effect, known as life? Is not the human body, therefore, truly a machine? Let us compare the seemingly most intelligent, the most human of hand-made machines, the locomotive engine, to the body of man. As you see the handsome, bright

locomotive rushing through the country at the rate of fifty miles an hour, drawing after it many tons of dead weight, without, to the eye of the casual observer, any visible reason or cause for it to move at all, does it not seem, even to the least romantic, to the most matter-of-fact individual, to be more than a mere thing of iron and brass? Does it not almost seem to possess life, *human life*, to be endowed with intelligence? It generates and transmits force, and as a resultant circumstance, it produces definite action. Neither are its performances, in reality, any less mysterious than the phenomena of human life. The fireman puts coal into the furnace and water into the boiler of his machine; the coal burns and produces heat, the heat expands the particles of water and converts them into steam, the steam is conveyed through a series of pipes and gives power and force to this mighty thing of iron to move and to present to our wondering gaze startling and marvelous exhibitions of power and strength. This much we know. But the *ultimate why*, the very intimate, minute and final question, *why* this burning of coal, and generation of heat, and vaporization of water, should convey to this hitherto heavy, dead, inert mass of iron such terrific force, must ever remain an unanswered question, a mysterious problem, as much so as the ultimate why and wherefore of all the mysterious phenomena of this beautiful and mysterious world. Now to our other machine, the human one.

Food is introduced into the stomach, it meets with and is acted upon by the juices of digestion, and as a result is converted into nourishment suitable for the body; as such (as blood) it is carried through a series

of pipes (blood vessels), and parting with its power or force, gives power and force to the various organs of the body to perform their different functions, the sum total of whose actions constitutes life. But the final *why* this food is capable of producing this force will ever remain an impenetrable mystery, as much so as the production of force from steam in the locomotive. The human machine, however, is, of course, infinitely more delicate, more wonderful, and more perfect in its organization and its manifestations than the locomotive. It is the highest type of machinery, upon which, however, all other forms are modeled. It clearly bears upon it the stamp of its divine and mysterious origin. The machine of iron is the work of man, and bears within itself no power of repair or renewal. Made by human agency, it possesses merely the power to utilize the fuel or food supplied to it, in generating force, and cannot, like the human machine, perpetuate itself. Once worn out, its elements can, it is true, be utilized in the manufacture of a new machine, but only through the intervention of the hand of man; while the human machine, once made by the hand or will of a divine power, not only possesses the requisites to generate force sufficient for life, but can renew and repair its waste, its wear and tear, and is capable of perpetuating, of originating machines like unto itself. The printing machine possesses the power of printing; the human machine is gifted with the power of writing. The human machine can walk; iron machinery, in the shape of clock-work, can give this same power to the inanimate doll of wood. The human machine can receive, digest and utilize meat and vegetables, and con-

vert them into force; the iron machine can receive and consume coal and convert it into force. The man-made machine requires periods of rest and repose, else it will prematurely wear out; the divinely-made machine likewise requires these same periods. The phonographic machine can speak; the human machine can do the same. The stove can generate heat by the burning of carbon; the human body can also produce heat by the same process. The human machine has the ability of relieving itself from any excess of nourishment which may be forced upon it; the boiler, through the agency of the safety valve, can relieve itself of any excessive and dangerous quantity of steam that may have been generated from too much nourishment or fuel. The human machine is sensitive to changes of weather; the barometrical machine also responds to them. The human machine, through the agency of its nervous system, can transmit impressions; the telegraphic machine does the same. The human machine has means of getting rid of its waste; the iron machine has similar appliances. The human machine can sew; the improved sewing machine can do it better. So I could go on indefinitely, and point out the resemblance between my human machine and the iron machines of men. The human body is, of course, a much, an incomparably, finer machine than any other. It not only possesses the properties of them all, but it is endowed with some functions wanting in them; thus demonstrating its divine handiwork. It can think; it possesses a mind, a soul, and hence is, in its original conception at least, a *perfect machine*; though, unfortunately, its perfection has in many cases been marred

by the hand of man. You have my reasons for calling your body a machine, and I have made my apologies to those whose sensibilities might be wounded by the apparent harshness of my comparison. I have endeavored to make you regard your body as a machine, for a purpose. The majority of men do not regard the body at all; they rarely think of it, and when they do, it is rather to regard it as a mysterious something, they know not, and care less, what. It serves their purpose. Through its agency they can make money and gratify their passions, and this is all they care about. When the body dies (in the commonly accepted usage of the term), that is, when the soul departs from it, the friends and relatives of this mass of clay pay great respect to it, and treat it as something sacred—the body, mind you, not the soul. This is additional proof (if any more were wanted than their every-day life) that the majority of men have either no conception at all, or, at the very best, a false one, of the true value of the body. The body, worthless as it may seem to cynical philosophers, is nevertheless, when truly weighed and considered, a most sublime machine. Upon its integrity depends all that is pleasant and desirable in life. As the residence of the intelligence of man, it is entitled to great respect. As it would be impossible to generate great steam power in a weak boiler, so it is impossible to produce intellectual greatness in an unsound body. The psychical life must be fed from a healthy stomach, and have healthy surroundings, else its manifestations are limited.

Since the engineer takes better care of his locomotive, oftentimes, than he does of himself, realizing how

easily it may get out of order; and since man generally considers human-made machinery as very delicate and very easily deranged, and hence requiring great attention, it has occurred to me that if man were to realize that his own body is but a machine, he might be induced to treat it with more tenderness and consideration. Hence my reason for demonstrating the similarity between the body of a man and a machine.

We will now proceed to the second portion of our chapter.

II. WHAT IS LIFE.—A short definition has already been furnished, and in a practical work, we need say but little else, since, for all practical purposes, every one knows what life is.

But if we may be pardoned the digression, let us for a moment lay aside the mechanical aspect of man, and in connection with *life*, viewing man from a less mundane and a more spiritual standpoint, inquire again *what is man?* Religion tells us, "Remember, man, that thou art dust, and unto dust thou shalt return." Philosophers moralize on the worthlessness of the human body, and satirize it. Poets sing the praises of the *soul*, and deride its residence of clay. The medical man regards the body as a general hospital, and its diseased organs as patients requiring his ministrations. The business man works his body for all it is worth, and considers it an indefinite something, never stopping to reflect what it in reality is. What then is man from this new standpoint? Man is, in reality, an *animal*, just as much so as a fly, a flea or a mosquito is. Man is a combination of organs and parts; man is a machine; man is an animal. The microscopic germ, invisible to the naked eye, of

[the trichina in pork, is a living animal, as much so as man is. It is capable of growth, development and reproduction, just as man is. The horse, the cow, the dog, the wild beasts of the forest and the fishes of the sea, are all animals, just as man is. They all consist of an aggregation of organs and parts, whose functions and duties are to originate, transmit and modify force and motion. Wherein, then, lies the difference between man and the lower animals? Merely in the superior capacity for development enjoyed by man. Man alone, of all the animals, possesses a soul, and this mysterious and wonderful soul is merely the condition of high psychical development of which the *human* animal alone is capable. The soul is a mysterious something, which always has and always will be an indefinite, intangible idea. The anatomist cannot point to any organ and say, "*this is the soul.*" The physiologist cannot accurately or satisfactorily designate the functions of the soul; while the theologian does tell us that the *soul is that portion of man which is in intimate relation with the Deity.* This explanation, unsatisfactory as it may be to the scientific and materialistic mind, is undoubtedly the best and fullest definition of the soul that we can have in this world of mysterious uncertainties, and with it we must be satisfied. However, a metaphysical discussion concerning the identity of the soul is useless and unnecessary. Profound thought, speculation and penetration into the impenetrable religious mysteries have usually, or indeed always, one of two terminations. They end either with as much doubt and uncertainty as they began, or they are brought to a rational close in a lunatic asylum. Therefore, let us relegate these

problems to the poor fools who, in their blind egotism, foolishly imagine that they possess the divine wisdom necessary to unravel them, and talk about something that our human minds can comprehend, a knowledge of which will redound to our benefit. So, let us define *man* as the most perfect illustration of the highest type of animal life. Let us define an *animal* as a collection of organs and parts whose duty it is, each to contribute its individual work toward the performance of one grand function, which function we will call LIFE.

Now, then, we have hastily studied the human being under two aspects—

I. The human body, without taking into consideration the vital force or life, and this aggregation we denominate a *machine*.

II. The human body endowed with vital force, life or intelligence, and this combination we call *the highest type of animal life*.

This brings us to our third heading—

III. GENERAL RULES FOR ITS PROLONGATION.—This subject will be considered in detail in the various chapters of this book, but some general remarks on the subject will here be pertinent.

It is a significant fact, and one worthy of note, that physicians, as a class, are long lived. Of course, leaving out of consideration those who die from acute and contagious diseases or from exposure incident to the practice of their profession, and considering those who die from chronic diseases, which, if not inherited (and even then, very often), are in many cases directly traceable to and much influenced by mode of life. Why do physicians enjoy in an especial degree this great

boon of long life? Because they have a knowledge of physiology, they are familiar with the duties and functions of their organs, they know how to treat them in order to keep them in good condition, and to get out of them the greatest amount of work of which they are capable, to preserve their integrity and their functional activity for the greatest possible number of years; in other words, they know how they ought to live, just as the engineer knows how he ought to care for his engine; and the majority of them do live as they ought to.

To live as you ought to, all your functions must be properly performed. To have them performed properly you must treat all your organs properly. The human machine is so delicately made, its various parts are so accurately adapted and so nicely fitted, that they are, so to speak, interdependent; each system, each set of organs, though anatomically distinct, and physiologically unlike (to a certain extent), having duties to perform, each peculiar to itself, are dependent one upon the other, and without any particular system or set of organs life would be impossible. To illustrate. The furnace and boiler of a locomotive might be perfect, the fuel good and the water plenty; steam would be generated; but if the driving rod were broken or out of order, the locomotive could not move. Again, the driving rod might be perfect, but one of the wheels broken; the engine could not perform its work. Every part of this machine must be in order or it cannot perform its duty. So it is with the human machine. No one part can be really called more important than another, since all are absolutely necessary. Therefore all must be treated with the greatest politeness and consideration.

Dr. Hufeland enunciates an eminent truth when he says, "*The more a man follows nature and is obedient to her laws, the longer he will live; the further he deviates from these, the shorter will be his existence.*" To believe this, you have only to consider the lower animals, who live in strict accordance with nature. Many of them, as the horse, the dog, and so on, are formed very much as man is, so far as their internal organs are concerned, and yet how much more work, physically, even in proportion to their extra strength, they are capable of performing, and how comparatively little disease exists among them. This is largely due to the fact that these lower animals, lacking the superior intelligence of man, are guided alone by their *instinct*, which might be called their natural intelligence. See how carefully a dog will smell any new and unfamiliar article of food, before tasting it, and how very few things he will eat.

Indeed, my friends, we can all learn many of nature's laws from the brute creation. I have now four little bull pups. I am daily amused and instructively edified to see how they will greedily lap up their meal of milk, and, when satisfied, will toddle back to their house, lie quietly down, lick their chops, and placidly wait till the milk is digested and made into nourishment for their little bodies. They know and appreciate, better than most men do, the secret of digestion. They do not rush off to work or play with their stomachs full of food, but realizing (solely from the instinct that guides all of their actions) that rest and quiet are absolutely necessary to proper digestion, they lie down and wait. Their want of the higher intelligence (which I am afraid

proves oftener a curse than a blessing to man) prevents them from inventing food or drink which will be injurious to them, and their instinct, whose dictates they always obey, causes them to reject that which is injurious or hurtful to them. The cow is an animated machine. Raw cotton goes into the mill by one door and comes out of another as beautiful white muslin. Green grass goes into one part of the cow and comes out of another portion as rich, nourishing milk. But the cow is a very sensible machine. When her stomach is full of grass, she does not run around and play, but quietly lying down in some shady spot, she chews, and chews, and chews, and at the end of the day, behold, we have several quarts of milk. If she does run around, or if you chase her to the milking place, her machinery is deranged, the process of manufacturing milk is improperly carried on, and the supply, in consequence, is inferior and unhealthy. So it is with man. If he fails to do what he ought to do, his delicate machinery becomes deranged, and all the phenomena of life, manufactured by this imperfect machinery, are incomplete in their manifestations.

Our bodies are continually dying piecemeal, and continually being renewed, from the very date of birth until the final period of death of the body in mass. That is to say, every act of life entails the destruction (or to be more correct, since matter is indestructible, causes such a change in the composition of the material engaged in such action as to render it utterly unfit to form a part of the body) of that portion of the body in which such action has taken place. To illustrate: suppose you bend your finger; muscular action is neces-

sary to do so ; well, some portions of the muscle which has contracted to bend your finger have by that very act been so altered in elementary composition that they cannot any longer form a part of that muscle ; they must be removed, and in their stead new muscular tissue will be deposited. The familiar saying, that the body of man changes in its composition every seven years, is, therefore, in the abstract, true, though no definite time for this change can be assigned, for the following reason : use causes destruction or alteration. There are certain involuntary functions of life ; such as the heart's action, respiration, digestion, assimilation, secretion, excretion, and so on, which are continually in operation, and which go on independently of the will, and over which the will has no control. These duties will, of course, cause the alteration of the elements of the material concerned in their performance. But in some bodies these various functions are much more active than in others. Again, there are certain voluntary phenomena of life, certain duties that are directly under the control of the will ; as walking, riding, talking, singing, thinking, muscular contraction of various kinds, and the like. Now it is a well-known fact that some persons perform much more voluntary labor than others ; therefore, of course, in such the changes of tissue will necessarily be much more rapid. But to reiterate, every act of living, voluntary and involuntary, entails, as a result of its performance, the alteration and subsequent removal of the tissue concerned in its performance. This void must be filled, else the body would be incomplete. The food we take, is principally to supply the waste occasioned by this death.

To maintain a perfect life, in a perfect manner, a fully developed man must daily give off a sum of dead and worthless tissue, equal to the amount of renovating principles which he takes into his system. To illustrate: suppose in a stove you burn a given amount of coal in twenty-four hours. The residual ashes, with the gases given off, if all collected, would be found to exactly equal in quantity the amount of the original coal, which, during its chemical transformation into ashes and gases, has produced heat. But if you do not remove all of the waste, if you allow each day a small and daily increasing quantity of ashes to remain in the grate, by-and-by the stove becomes choked, the coal cannot properly burn, and the heat is not produced in full quantity. The function of the stove is interfered with by the accumulation of dead coal or ashes. So with the human body; if the dead tissue is not all removed as it should be, if the organs whose duty it is to effect this removal do not properly do their duty, this dead tissue must remain in the body, and so remaining, it must interfere to such an extent with the functions of the body, that the grand combined function of life is but imperfectly carried on. In other words, the reproduction must exactly equalize the destruction. In childhood and youth the reproduction exceeds the destruction, because the body is not yet fully formed, and needs to grow, as well as to *live*; in old age, and as we near final death, the decay predominates; while in the prime of life, when the body is fully formed, these two processes must be equal, if we desire perfect health. Hippocrates thoroughly realized this fact when he said, "There must be an exact bal-

ance between food and exercise, and that disease results from excess either way." By this word *exercise*, you must understand that he means the functions of life, since all motion, all duty, is really exercise (the word properly used not being confined to calisthenics), and therefore all performance of duty on the part of vital organs is in reality exercise of them.

EXCESS.—One of the greatest enemies to longevity is *excess*. Excess in anything is improper, and to a certain extent prejudicial to the enjoyment of perfect health. Excesses of some kinds, such as in good, wholesome exercise, pleasurable emotions, agreeable and light labor, mental or bodily, will not, of course, prove so injurious to our life and health as the excessive indulgence in unwholesome food and drink, violent passions, great muscular and mental strain, or the like. Still, at the same time, the grand fundamental principle always has, still does, and always will hold good, that a happy medium in the exercise of all the functions and powers with which a kind Providence has endowed us, conduces in the highest degree to the enjoyment of the longest life in a state of health, of which each individual organization is capable. ,

Dr. Hufeland tells us that "No *idler* ever attained to a great age." For many reasons this is true ; but suffice it here to say that, as excess of work does injury, so too little work does equally much or more harm to the vital organs. The life organs become rusty, as it were ; not receiving the natural stimulus of healthy action, they prematurely give out, and early death results. Therefore, again, you must understand that all parts of our human machine must work properly.

Parke, in the introduction to his work on Hygiene, says, "In the midst of all our weakness, and all our many errors, we are certainly gaining knowledge, and that knowledge tells us, in no doubtful terms, that the fate of man is in his own hands." What a pregnant sentence. He means therein to convey the idea, that many of the diseases incident to life are very much under our control, and that their existence may, in time, be eradicated by proper hygienic measures. That there can be no doubt of the truth of his statement numerous facts furnish evidence. Prominent among them, I might cite the fact that in England, during the last two hundred years, the annual death rate has been reduced from 80 in every 1000 to 24 in every 1000. During this period, sanitary societies and boards of health have been organized, hygiene has been recognized as a science, and the medical profession have, year by year, given more attention and thought to the *prevention* of disease. An ounce of prevention is worth a pound of cure, or, as Dr. Parke says, "It has been proved over and over again that nothing is so costly in all ways as disease, and that nothing is so remunerative as the outlay which augments health, and in doing so, augments the amount and value of the work done." Sensible and progressive mill owners can fully realize the entire truthfulness of this statement.

It will be useless and unnecessary to here discuss how long a man ought to live. Many learned theories have been advanced on this point, but still we cannot set a definite period, and say to man that he ought to live so long. His length of life (from what I have

already said) will be dependent upon two points: *First*, the amount of vital force born in him, and *second*, the care or neglect which this vital force receives. The vital inheritance which he receives may give him the power to live to a certain age, as it no doubt does, but by abusing and foolishly wasting this force, he may, and undoubtedly will, die much sooner.

There is a thought occurs to me about longevity, worthy of record. In Europe we find many more persons reaching extreme old age than we do in the United States. Now why? Because in Europe the various countries have been settled and developed for many years, and the inhabitants thereof have had time to devote some attention to strictly personal considerations. To follow this thought and bring it down to narrow confines, let me remind you that New England is the most populous, most developed and most refined portion of the United States, and that there we find the greatest proportion of aged persons, as the statistical tables in my appendix will demonstrate. Now, again, why is this? Because in every new and undeveloped country man is so busily engaged, his time is so thoroughly occupied, and his energies are so completely consumed in developing the natural resources of the country around him, that he has but little time to bestow upon thought of himself. When the material resources of a region are developed and settled upon a secure basis, man then has time to spare, and, oftentimes for want of something else to do, he commences to think about himself, and to give his body some consideration. Thus it is that we find the greatest longevity where we find the greatest refinement and cultivation, and thus it is that,

unfortunately, in the United States, we find so many premature deaths from overwork and exhaustion. This has been one of my reasons for preparing this work, since, if I can cause my countrymen to consider themselves (from a rational standpoint) a little more than they do, they will be able to develop their country in due time, while they will also preserve that measure of health, and attain that degree of longevity which they ought to.

Let me conclude this preliminary chapter, by again telling you that you have your own life, to a great extent, in your own hands. If you live properly, you will reach a ripe old age ; if you do not, you will surely die before your ordained time.

Before taking up the different portions of this work in detail, let us for a brief space consider, that we may rightly understand, what are the duties of the human machine. This is not a work on either anatomy or physiology, therefore we will not discuss the formation of the various organs of the body, neither will we enter into their minute functions. But we will merely decide what are the visible, obvious duties of life, and describe how these duties must be performed in order that long life may be enjoyed. In order that a man shall live in the world of to-day, he must eat, drink, sleep, work, exercise, dress, breathe, rest and get rid of waste. These are the principal points upon which human life is dependent. There are many collateral questions to be considered, but these are the absolutely essential ones. In the body of this work we shall take up each one of these necessities of life, and explain how (and why) each duty of life should be performed, in order

that health and long life shall be secured. One word more of explanation, before we enter into the soul of our work. It has been said, and truthfully, that a little knowledge is a very dangerous possession. Particularly has this been applied to a *little* knowledge of medicine and its collateral branches. I do not intend in this work to give you this dangerously small amount of medical information. Again, persons often say; if I have to live by *strict* rule, in order that I may live long, I would much prefer to live as I choose, to enjoy myself, and die sooner. I do not intend to enunciate *strict* rules. I appreciate myself, as thoroughly as any of my readers possibly can, how very irksome and disagreeable the *very strict* rules enunciated by some physicians are apt to become, and I know full well how difficult of observance they are, and how very frequently they are disregarded. I also realize that the mental anxiety oftentimes induced, either by the effort to follow, or the worriment caused by a conscious disregard of, the strict rules, will so react on the system as to defeat the very purpose for which they have been formulated, and will rather tend to shorten than prolong life. Finally, I also know, that excessively stringent rules of life are, in themselves, de facto, in many cases, directly opposed to the promotion of longevity.

Therefore, let it be clearly understood, before I formulate them, that my laws of health will be neither *very strict* nor at all unpleasant nor irksome. They will be so easy, and their prosecution attended with so little self denial, that in a short time the majority of persons will find them much pleasanter than the way they have been living, and will derive positive pleasure

and satisfaction, as well as health and longevity, from their observance. I had a gentleman say to me (only yesterday), when I had told him that by doing as I desired he might live twenty years and more, though a confirmed invalid, "*Oh! yes, by doing as you desire; but you won't allow me to do anything.*" When I brought him down to close quarters, he was forced to admit that all I had asked him to do was to go to bed early (about ten or eleven o'clock), to get up early, to eat regularly, to exercise, and to limit his allowance of whisky and tobacco. Not very hard rules, yet he fought against them; though by their observance he has improved in health and can enjoy life much more than formerly.

Observation of nature and hygienic research have enabled us to penetrate very far into the life which our Creator desires us to live, and when we understand it rightly, we discover that such a life does not necessitate the deprivation of one single rational enjoyment.

In order to be systematic, I will commence at the beginning, and will point out the mode of life that is suitable for infants. I will then direct the baby through the various stages of life, until it reaches maturity, when I will discuss in detail the life that *ought* to be led by an adult.

CHAPTER II.

HOW TO CARE FOR INFANTS.

So many good books have been written on this subject that I will not attempt to go into detail concerning it. This volume is merely intended to give *hints* as to how a person may live *comfortably* as well as wisely. I will repeat again what I have already said, that I do not intend, neither do I think it wise, to enunciate very strict rules, since if I did they would surely be violated. Therefore, I only enunciate the most important ones, by a faithful observance of which a reasonable degree of longevity may be attained. For those who may need or desire information on any special subject, there are an abundance of very good books to which they can refer. This volume would be larger than Webster's Unabridged, were I to minutely discuss all the subjects contained therein. So I only outline them, but sufficiently comprehensively to insure long life to those who follow the precepts enunciated.

Attention to the new-born child is evidently of paramount importance, since, by care or neglect, you may lay the foundation for future health and happiness, or for sickness and misery.

A golden and primary rule is that, whenever possible, mothers should nurse their children. There are, of course, some cases where this is not advisable, but such a question ought to be decided by an intelligent physician.

Babies ought to be nursed, as nearly as possible, at regular intervals. A vigorous baby, when very young, should be nursed not less often than every three hours, and if you can get it in the habit of sucking at regular periods, you will find it much better for the baby and more comfortable for yourself. Some babies will suck as long as you will allow them, not seeming to know when they have had enough. They thus over-distend their stomachs, giving them more work to do than they can accomplish. You will know this to be the case, when you notice them spitting out a quantity of milk after nursing. Hence I would recommend you to take them away from the breast before they leave it of their own accord. If you have been nursing them for five minutes at a time, reduce it to three, and in a short time you can tell by experience how long it takes for them to get what they require, thus easing their little stomachs of excessive work, and what is very important to the nurse, keeping their clothing clean.

This is really one of the most important and one of the most generally neglected rules in the management of infants. Every physician has often had young mothers come to him, complaining that "baby cries so much; it cries all the time;" upon asking the question "what do you do when baby cries?" the answer is, "I put it to the breast, because I think it must be hungry; but it cries all the more." Of course it does. Baby is crying because it has dyspepsia. You are overloading its stomach. I have repeatedly given the directions noted above to such persons (without any medicine) and the result has been that baby did not cry any more. It is difficult to induce mothers to carry out

this advice, since they deem it cruel to refuse the breast to baby when it is crying; but if they will only persevere for a while in this plan, they will find it to work admirably.

Babies require to be bathed more frequently than grown people, because the structural changes are more rapid in them. Their skin is more delicate, and much more susceptible to harm than that of an adult, from the accumulation of dirt upon it. Therefore, a baby should, in summer time, be bathed daily, and in winter at least three times a week. This bath should be given just before the mid-day nap, which all babies require, since it is necessary for them to have more sleep than adults.

You must remember, that while in the fully formed adult the processes of waste and repair are continually going on, in the baby, in addition to these processes, development and growth are taking place. Since this additional duty imposes extra work on all the organs and parts, so, logically, do these organs and parts require more rest; therefore is it that nature ordains that the greater portion of a young baby's life is passed in eating and sleeping.

Young mothers must realize, if they desire to have strong, healthy children, that their duties commence from the very hour of birth. They must clearly understand that from the very first day of life must commence the education and training of the child. The sooner this process is commenced the easier will it be to carry it out, since the younger the child the more pliable it will be, and the more susceptible to good or bad influences.

As a rule, young mothers with their first child know very little, and unless guided by wiser counsel, are very apt to fall into errors of a most serious nature.

I once knew a very intelligent lady who, upon the birth of her first child, was unable to nurse it, because she did not have enough milk. Deciding to give it the bottle, she asked her doctor how to prepare cow's milk for the baby. He told her to commence by using about one part milk and one part water. This mixture looked very weak and watery to her inexperienced eyes; she felt sure that it did not contain enough nourishment for her baby, in spite of the more experienced statement of her physician. She had the idea that most young mothers have, that the richer the food the more nourishment it contains, and she did not know that a baby's stomach is a very delicate organ. Therefore, she reasoned, or impulsively concluded, without reasoning, that the doctor was wrong, and that she knew better than he did what was good and proper for her baby. So she not only gave baby pure cow's milk without any water, but actually would add to it cream. The result was that this food was too rich for the little baby's stomach, and he had dyspepsia; he was unable to digest it, so that until he was three years old he was subjected to all the sufferings and inconveniences of indigestion. A very careful diet ultimately restored the stomach to good condition, but it required great caution, and was a great source of worriment to the mother, when it could all have been avoided by acting on the physician's advice. So, you see, young mothers require a great deal of advice, or they and their children will suffer for the want of it.

It is true that instinct teaches them a great deal, but it will not suffice for all the emergencies that may arise during infancy. Instinct is a very reliable guide for the lower animals, and to a certain extent, does assist human nature, but it will not do all, because human nature is much more apt to go wrong than the lower animals. The intelligence of the brute is so much below that of the higher animal, of man, that its actions are subordinate to and are controlled by instinct; but when we rise to the level of the human being we find intelligence, we find the ability to think, to reason, and to formulate actions on the result of this reasoning, therefore, instinct becomes a subordinate influence; its place in the lower animal is, in man, filled by reason. Since this ability to reason has been vouchsafed to the human kind it becomes necessary that we learn how to reason correctly, and to do so, it is an essential that our groundwork—that our first arguments—upon which we base our reasoning, be correct.

When we come to medical subjects, it is not to be expected that those outside of the profession would have the knowledge necessary to direct their reasoning into the proper channel; how could they? Their lives may have been devoted to farming, to mercantile pursuits or to what not; but unless they have made a special study of medicine they are incapable of reasoning on medical questions from a just and substantial basis. Therefore it becomes the duty of those who have made a special study of this branch of science, of physicians, to so enlighten their fellow creatures on some of the fundamental truths of human nature, as to enable them to reason intelligently for themselves.

Especially is this important in the care and management of children. The young infant is full of possibilities ; no one can say for what grand possibilities he or she may have been created, and but few mothers realize how great a part they have to play in the fulfillment of their children's destiny.

How little did poor old Mrs. Garfield imagine, when nursing her baby at the breast, that he was one day destined to become the ideal hero, not only of a great nation, but to be admired and mourned over by the universal civilized world. Yet so it turned out. I would say to every young mother, you have no more idea of the future of your son or daughter than this good old lady had, but at the same time I must say, you have the power to influence baby's future life most absolutely in your hands.

To understand this, you must know that all parts of the human body are very intimately associated one with another, through the agency both of the circulation (that is, the blood) and the nervous system. It is very rarely the case that one part suffers alone ; you will generally find that when one organ or part becomes deranged, some other organ or part will have a share in the trouble. When a man fails in business it rarely happens that he is the only sufferer, since, owing to the credit system in vogue, many others are dependent upon him as he was upon them ; therefore, his failure has many ramifications, and shoots off into remote quarters, to influence many who were but indirectly connected with him. So in the human body there is a credit system, so to speak. Each organ, or set of organs or parts, are very dependent upon other organs or parts for

the ability to properly perform their duty. If A owes B one thousand dollars, B, if reasonably sure that he will receive the money at the appointed time, may, in good faith, promise to pay C six hundred dollars; but if in the meantime A fails, B will not receive the money, C will suffer, and through him D and all the rest of the alphabet will be inconvenienced. So with the human body. All the organs have a right to expect that the stomach will furnish good nourishment to them. If the stomach's messenger (the blood) stops at the liver and says to it, the stomach has failed to fulfill its contract; instead of giving me good nourishment to bring to you, it has sent me out adulterated; it has furnished me with a full quantity of material, but the quality is bad; it does not contain the necessary elements that you require to meet your obligations, I know; but I cannot help it, since I give to you what I have received from the stomach, and I cannot do any better.

The liver will then justly say, I cannot properly do my duty unless I receive good nourishment. How can you expect me to remove from the blood, to secrete and excrete, that which I ought ordinarily to do, unless you furnish me the necessary power to do so, in the shape of good, pure blood. I receive my nourishment from the blood, and my power to do my duty is derived from the blood; now if you, *Sir Stomach*, will send me bad blood, you interfere with my proper nourishment and you cannot expect me to do my duty properly. So the liver does not remove from the blood what nature intended that it should, and some foreign elements are left in this fluid. After a while the blood reaches the kidneys, which are eagerly waiting for good nourish-

ment. They recoil from this blood, as a merchant or a farmer would from a man who comes to tell him that he cannot pay a debt. These organs say to the blood we have duties to perform, we have obligations to the human body which we must fulfill, else health will suffer; we are scavengers; we have contracted to remove from the body certain elements of its waste; we are obliged to purify it. It is your bounden duty to constantly supply us with good nourishment, in order that we may fulfill our obligations to the rest of the body. Yes, says the blood, apologetically, I know that, but I cannot help it. I was dispatched from the central office, from the stomach, with poor material; it failed to fully meet its obligation to me. I called on the liver, and owing to the stomach's deficiency, it was unable to meet its contracts, so I am forced to come to you loaded down with the deficiencies of two delinquents.

Well, answer the kidneys, if you cannot do your full duty to us, if you can only meet a portion of your obligation, we cannot do our full duty, since we are dependent on you for the necessary nourishment and power. It will be impossible for us to remove our full share of dead tissue from the blood, since we do not possess the necessary vigor, which we can receive only from pure, sound blood.

Therefore, you must continue to contain some of the load of debt, of dead tissue, that under ordinary conditions we would remove from you, and adding it to that already left in you by the partial failure of duty of the liver, carry it on, to still further hamper the other organs you may meet in your course.

The poor, overburdened blood now visits the heart,

the central organ of the circulation, the ever-acting pump, that is day and night sending the elements of life into the most remote corners of the human body.

Just here, by way of digression, I must say, that while repeating what I have already stated, that all parts of the body are inter-dependent, that life could not be without all of them, still, there are two prime elements in the phenomena of life, the blood and nervous system. The first furnishes nourishment, the necessary conditions for the maintenance of life, while the nervous system originates and transmits the vital spark by which the elements furnished by the blood are rendered potent. The blood might be roughly compared to ordinary illuminating gas flowing through a pipe; it might be for years forced through this pipe without giving any light; but when you apply the match to this escaping gas, you at once have a brilliant illumination. So, the nervous system furnishes and transmits the spark that enables the heart to pump the blood through the body, and that renders the blood potent to maintain life in all the organs when it reaches them. But, in order that the heart may continue its pumping, it requires to have a sufficiency of good nourishment, which it must derive from the blood. There are small blood vessels in the walls of the heart, into which blood is pumped by the heart itself, and from which the organ derives its power to pump. Therefore, it is necessary, in an especial manner, that this important organ should receive good nourishment.

To go back: this impure blood reaches the heart. Here it receives new reproaches for not meeting its obligations. The same story is told over again; the

blame is laid at the doors of the stomach, liver and kidneys. How can you expect me, says the blood, to pay the debt I owe you, when so many other creditors have failed to meet their obligations to me. True enough, replies the heart, but how can I fulfill the duties I owe to my creditors if you fail to bring me the necessary nourishment or vigor. How can I pump the requisite blood into the brain when I am weak and exhausted, for the want of proper nourishment.

Now, in turn, the heart sends blood to the brain and nervous system, but it sends an inferior quality; it does not fully meet its obligations in this quarter. The brain cries out, "How can I originate and issue my commands to the various organs of the body, when I am weak and languid for the want of food. How can I do my duty when I am so interfered with. I am like the General of an army; from my headquarters I telegraph through the human wires, the nerves, to the various organs, what they must do in order to carry on a successful campaign against disease; but if the commissary fails to supply this general with good nourishment, how can he do his duty. He will become weak and languid, while his mental activity will be diminished, for want of good food on which to subsist."

But, answers back the heart, "I am doing the best I can; the stomach, liver and kidneys have failed to perform their duty, they have sent me impure material" (like the contract supplies to the army during the war), and I have no better to send you. I know it is wrong, but I cannot help it. I know you cannot fully exercise your abilities on such poor nourishment, but I cannot send you any better until my subordinates properly

perform their duty. I would suggest that the stomach is primarily to blame, and since that organ is especially under the control and management of an officer called *Human Intelligence*, I would suggest that he be severely reprimanded, since he must be guilty either of carelessness or criminal neglect in his management of that organ." "Very good," says the brain, "your suggestion is a valuable one, Mr. Heart, and I shall admonish *officer Intelligence* of his dereliction."

Accordingly, a severe stomach ache, an inflammation of the stomach or its continuation, the bowels, or some other bad feeling, is produced, as a warning to *Human Intelligence* that it is not properly performing its duty; that by maltreating some organ, it is interfering with the proper performance of duty of all organs, and is thereby shortening life.

When receiving this reprimand, *Intelligence* protests against the injustice of the order, saying, "It is not fair to blame me for not treating my organs properly, since I have never been taught my duties in this respect. What knowledge I have has been transmitted to me from my parents, who received it from theirs in turn, and that is all I know. I do not belong to the favored class of physicians, who have made the care of the human body an especial study, and I know not how to care for it; I do the best I can, with my limited knowledge, and if I knew more, I would, no doubt, do better." This is a valid objection, and it has been my purpose, in preparing this volume, to furnish to *human intelligence* that knowledge in which it is deficient, and which is so essential to it, in order that it may so direct and regulate its various organs as to conduce to old age,

by furnishing them with good nourishment, and getting out of them the greatest amount of work of which they are capable.

This is a homely illustration, but by its very familiarity and simplicity, I feel sure it will convey to non-professional readers the point I am desirous of impressing upon them—the fact that every part or organ of the body is dependent for the integrity of its action upon the integrity of every other organ or part. It is true, that life has been sustained, in exceptional instances, when some organ has been incapacitated; thus there are cases on record where one kidney has become utterly useless, and life has been sustained for some time with the aid of only one kidney. Or the liver, or stomach, or heart, has been seriously disordered, yet life has been maintained for some time. But while these are exceptional cases, they only tend to prove how strong is the claim of human nature upon life and of life upon human nature, and are strong arguments in favor of the doctrine enunciated in this work, that “It is never too late to mend.” These cases do not, however, argue the independence of one organ from another, but only constitute the exceptions to the rule, that all organs are dependent one upon another. While it is the rule that, in order to enjoy very great longevity, every organ and part must act thoroughly, yet it is very comforting to know (and we do know, and you can feel sure of it), that if any one of you happen to be the unfortunate possessor of any weak organ or part, if you discover this defect, you can by strict attention to hygienic laws and to the advice of your physician, so conserve the vital power of this part as to make it last

very much longer than it would do did you lead a reckless life, placing upon this weak organ more strain than it can bear.

I wish again, here, to say, that this volume is not intended to take the place of the physician; it would be an impossibility for any volume to do so. You can make up your minds that any book that claims to substitute the physician is worse than useless to you. Because there are so many points to be considered in the treatment of diseased conditions, there are so many collateral circumstances to be taken into consideration, so many new points are constantly being developed, that it would be impossible for any man who did not devote himself and his life continually to the study of the science of medicine and to keeping pace with its progress, to be capable of treating disease. Therefore, when a person is out of health it is necessary for him or her to consult a physician; but there are certain well known principles that will conduce to keep human beings in a state of health, and it is these principles that this book will teach you. It will tell you how to preserve health when you have it, and how to live so that you may attain long life.

What I have said for some pages back may seem, until explained, inappropriate to a chapter on the "*care of infants.*" But a few words of explanation will demonstrate that this was the most appropriate portion of this work in which to introduce these remarks.

Since, as you now know, the young infant is very pliable, is very capable of being moulded into good or bad form, so you can understand that this knowledge of the effects that may result in after life from ignorance

of the functions of the body becomes a matter of paramount importance in the management of the infant.

. You know the old saying, As the twig is bent, so the tree will grow; this is very applicable to children. At the risk of being considered tedious, I am going into this question somewhat at length, for I assure you that a very large proportion of the ill health of after life, ordinarily attributed to various other causes, is in reality directly due to the improper management of young children.

A baby might, for the sake of familiar illustration, be compared to a plot of virgin soil. If an intelligent farmer, who thoroughly understands his business, goes to work, he can make this ground produce almost any crop he may desire. The soil is rich in possibilities, and only requires careful nurture to develop them. But the farmer must select good seed, he must prepare his ground to receive the seed, must plant in the proper season, must watch carefully and continually cultivate the growing plants. He must be on the lookout for any diseases or any animals that may destroy their vigor, and take prompt measures to get rid of them. If all these precautions are observed, in due time he reaps a bountiful harvest of *strong, vigorous* vegetables or fruit, bearing no taint or blemish, and thoroughly capable of fulfilling their mission in the world, of giving nourishment to human beings.

So the infant is like virgin soil; it is a mass of humanity, placed in the world in a perfectly dependent and irresponsible condition, capable of being moulded, as a piece of putty, and undoubtedly subject to the influence of surroundings. If you will devote as much intelligent

care to the management of your children as is requisite and is bestowed upon the soil, you can be sure that they will grow into strong and useful men and women.

The old proverb, "That it is as hard for a rich man to enter heaven as for a camel to pass through the eye of a needle," is but another way of saying that temptation surrounds us on every side. We must, perforce, believe that the *Almighty* has in store for the just most wonderful happiness, since he has made it so very difficult to attain. The reward must be proportionate to the labor. When I say that temptation surrounds us, I do not speak alone from a moral standpoint; I include physical temptations. It is a singular but nevertheless an eminently true fact, that man, even the most intelligent among us, when left to his own unguided instinct in matters of living, is apt, in the majority of instances, to go wrong and do that which is injurious to his physical welfare. While, when we descend to the illiterate classes, this tendency is truly astounding. I once attended a case of Bright's disease in a young man. There was suppression of urine, by which the poisonous ingredients of the urine were retained in the system, and the boy was dangerously ill from this poisoning of his blood. I gave strong medicine, to make the kidneys act and remove this poison. My medicines acted as I had expected, yet the poisonous symptoms grew worse. I was at a loss to account for this unusual condition, until I discovered that the boy's mother had been for several days surreptitiously *giving him his own urine to drink*, under the superstitious belief that this liquid possessed the power to increase the action of the kidneys.

Who ever heard of a dog or a horse who would eat or drink its own excrement? Yet this woman's *intelligence* was a less accurate guide in matters of health, than the unaided *instinct* of the brute.

This case, which is one out of many that I could give, tends to show the truth of what I say, that the natural intelligence of man, when unguided, will usually lead him to do the very things that he ought not to do.

A celebrated physician once said that *we ought to be ASHAMED to be sick*, and then went on to show that the majority of cases of illness were directly traceable to some infraction of the laws of health, and were avoidable. More than one hundred thousand persons die annually in the United States from diseases that are preventable, and I do not fear contradiction, when I make the seemingly astounding statement, *that not one single person ought to die of disease*. A few words of explanation will here be necessary. We are sufficiently familiar with the nature of all acute diseases to know broadly that they all arise as a consequence of neglect of hygiene. We all know that if the laws of hygiene were universally perfectly carried out, such diseases as smallpox, cholera, yellow fever, diphtheria, typhoid fever, scarlet fever, measles, whooping cough and the like, would never be heard of. This is an admitted fact by the universal medical profession, and needs no argument. Many persons die from these diseases. Then we have chronic diseases. They affect the heart, lungs, kidneys, liver, stomach, etc.; in the majority of instances these diseases are preventable, and are due to neglect on the part of the sufferer. One illustration will suffice. The majority

of cases of chronic disease of the liver are due either to improper and excessive eating, or to inordinate indulgence in alcoholic drinks. This brings us to hereditary diseases.

I desire here to enunciate the doctrine that all chronic diseases are hereditary in the general acceptance of the term. That is to say, all chronic diseases are capable of transmission from parents to their offspring. The general tendency of the day is to believe that only certain diseases, such as consumption, scrofula and the like, are hereditary, but I believe it to be a fact, as the result of research, thought and experience, that all chronic diseases can be inherited. *I do not say that they always are, but that they can be.* A child generally inherits the peculiarities of personal appearance and of disposition possessed by its parents; why, then, should it not derive at least a tendency to disease of any organ that may be diseased in the parents?

The material from which the child is formed is derived from the blood; the blood circulates throughout the entire body; it receives some of its component parts from every organ in the body, and from it (the blood) certain organs extract a liquid, which when it unites with another liquid in the female, results in the development of a human being.

Does it seem unreasonable, therefore, to suppose that when the blood circulates through a diseased liver or heart in the parent, it may receive some of the elements of disease of the organ, which, removed from it into the constructive fluid, may, in the child developed from this fluid, predispose to disease of the organ that has been constructed from the elements furnished by

blood that has passed through, and has been to a certain extent influenced by, a diseased organ in the parent?

It is true that this doctrine has not yet been established, but it is worthy of more extensive research, and a belief in it can be productive of no harm and will be beneficial in the following manner: Suppose a parent (either father or mother) is aware that some organ in his or her body is diseased at the time that the elements from which their child has been formed are extracted from their blood. Then does it become an imperative duty that they shall in an especial manner guard and protect this particular organ in their offspring. Suppose a father has Bright's disease; then must he carefully guard his children's kidneys; suppose a mother has heart disease; then must she zealously look after the care of her children's hearts.

So that, taking it for granted that all chronic diseases can be inherited, we have, to summarize, these three conditions under which death may occur from disease: 1st. Acute diseases, in all cases preventable by proper precautions; 2d. Chronic diseases, due either to excess or neglect on the part of the individual; or, 3d. Inherited from parents. Hereditary diseases must have had a beginning; they must have originated in some ancestor; therefore they were due to some fault of his, and were preventable.

It is a well known fact that if a child does inherit a tendency to any disease of any organ or part from its parents, this tendency can be held in abeyance, if not entirely eradicated, by proper precautionary measures. If the tendency to disease cannot be entirely

stamped out, the period of its development can be indefinitely postponed.

Therefore, by carefully guarding any particular organ or part that may be born weak, its integrity may be preserved, and the weakness which it inherited may be transmitted to its offspring with less intensity, and so on through successive generations, until it finally becomes extinct. Thus could the hereditary tendency to disease be guarded against and rendered impotent, until, ultimately, the original perfectly healthy state of man could be brought about. So, therefore, no matter how we view it, the fact stares us in the face, that disease is our own fault, and that no man *ought* to die of disease.

How, then, should he die? As a result of old age. As I have already said, a certain amount of vital force is born in every human being. In some a greater amount, of course, than in others. When this force is nearly used up a man is old, whether he has scored forty or eighty years of life; and when he dies, his existence is terminated because this force has become exhausted. Now no man ought to die from artificial or premature exhaustion of this force, as such an enormously large proportion do. All disease, as I have demonstrated, is artificial; it ought not to be, and, therefore, is not natural.

Disease, whether acute or chronic—that is to say, comprehensively, diseases of all kinds—has a tendency to unduly exhaust this vital force, and to produce premature death. If this force were only expended to produce the functions of an ordinarily healthy and rational life, the large majority of men would live

much longer than they do; but, being taxed to an inordinate degree, by the fretting exactions of some diseased part, it is consumed unnecessarily soon.

This vital power might be compared to human forbearance. If your surroundings are pleasant and agreeable, if your neighbors and your children all act as they should, then does your temperament remain even and equable. But, let your friends or your children run counter to your inclinations, let them annoy and worry you, how soon does your forbearance and your patience become exhausted, and you become ill-tempered and irritable. So, if your various organs and parts make demand upon your vital force only for so much as is proper and requisite to enable them to do their duty properly, then will this force hold out to its utmost limit; but if unfair demands are made upon it by some diseased organ that cannot do its work without the aid of an excessive supply of power, then will this vital force lose all forbearance, so to speak; then will this inordinate demand prematurely exhaust it.

Acute diseases act in the same way. The different fevers cause death by burning up this vital force. One of the main indications in the treatment of the various diseases that are accompanied by excessive fever, is to keep this fever in check, to reduce the temperature, because the physician realizes that this excessive heat is destroying the vital force that is so necessary in restoring the sick man to health.

Therefore, we realize that all life is dependent upon the presence of this invisible, imponderable, and mysterious *vital force*. We recognize that while this force lasts, so will life, and when it fails death ensues.

Realizing this, we are prepared to understand that the mode of life that is conducive to long life is such as will make the least demands upon our vital force.

Since, as you now know, the delicate system of the infant is very impressionable, since you know that it can be influenced for good or bad, and so profoundly as to carry the results of these impressions throughout all its after life; and since any weakness that it may inherit from its parents can be held in check or even eradicated by proper care, therefore, you can understand how appropriate have been these remarks in this place, and how imperative it is that young babies should be properly handled.

Very few women realize, when they voluntarily place themselves in the position of probable maternity, by marriage, what important duties they are likely to be called upon to assume. When these duties come upon them they are loth to devote themselves to them, since, by so doing, they interfere, as they suppose, with their own individual comfort and pleasure.

For the proper management of their children, mothers must make many sacrifices of immediate comfort, and must truly become almost slaves to their babies; but in after life they will be more than repaid for all this, by the satisfaction and gratification of a family of strong, healthy, active, and devoted children.

Having demonstrated why care of the infant is so necessary, it will now be in order to give you some directions for this care.

We will first consider an infant born to parents who are perfectly healthy; one whom you have no reason to suspect has, or ought to have, any weak organ or part.

The general remarks on nursing, in the first part of this chapter, are applicable to all children, whether born healthy or not.

For the first two weeks, the baby and yourself will be under the doctor's care, so that this book has nothing to do with that period; subsequently, if your experienced mother is about, you are fortunate; if not, I will take her place and tell you what to do.

It is well to commence, from the earliest moment, a system of so-called *hardening*, with healthy children. The degree to which this is carried must depend on circumstances. If, as is unfortunately the case with many women in this country, the mother has been surrounded during pregnancy with all the enervating influences known to man, such as excessively hot rooms, bad air, want of exercise, and the like, then will the child (though, maybe, not inheriting any diseased organ) be so enervated and functionally weak, that the process of *hardening* must be very gradual and be very carefully carried out. But if the parent has, throughout pregnancy, observed all proper precautions, and yet lived in accordance with nature, if she has braved all kinds of weather, then may the *hardening* process be more actively carried out.

What do I mean by this hardening? You all know how sensitive a hot-house plant is to the slightest changes of weather. The fall of a few degrees of temperature, or the change of a slight addition to or detracton from the requisite amount of moisture, may prove fatal to it. By *hardening*, I mean a condition just the reverse of this. Since, in the every-day pursuits of after life, your child will necessarily be subjected to

various atmospheric conditions, the changes in which it will be absolutely impossible for him or her to always avoid, it becomes imperative that you must, in the beginning, inure him to these changes, at such a time as his system is capable of being moulded ; and when this process can be best carried out.

In order to do this, you must allow your child to be taken into the open air on all occasions. Avoid only the most inclement days. Cold weather will not hurt him, if he is warmly dressed. Dress him so that he may not be subjected to the action of the cold on the surface of his body, and then send him out. Do not keep baby shut up in hot, foul rooms. By so doing, you will render him particularly susceptible to the slightest exposure to cold air or draughts. If possible, you ought to have your baby in the open air all day long. I am sure we would all enjoy better health, if houses were unknown, and we lived in tents or in the open air, as animal life in a state of nature is accustomed to do.

I am now supposing that the baby under consideration is a healthy baby with a healthy mother, who has an abundant supply of healthy milk. To such a one, I can sum up my advice in a few words. Feed your baby at regular intervals. Put baby to sleep at stated times, and *make* it sleep at those times. You can accomplish this if you will. If baby cries and will not go to sleep, do not take it up and rock it. Let it alone. A healthy baby will never hurt itself by crying, and after-a-while, by persevering in this course, it will get accustomed to its regular sleeping hours, and will willingly be quietly laid to rest and go to sleep at the appointed time. We are all creatures of habit, and

you can engraft on the baby good or bad habits, as you may see fit. Do not have the room in which baby sleeps too hot; keep a thermometer in it, and so regulate the temperature that it shall not exceed 70° Fah. If possible, so arrange that baby shall be in the open air all the time, when not sleeping or nursing. If you live in the country, during the summer months, baby can be in the pure air all day long. Suppose you happen to be a farmer's wife; you can so arrange a baby coach, or a lounge, or settee, that baby will be constantly under your eye, near a window of the room in which you may be doing your work. You can then, at the regular intervals, nurse the baby, put it back in its coach or on the settee, go on with your work, and let your child be constantly inhaling pure air.

To sum up, then, all that a healthy baby requires, in order that it may grow into a healthy man or woman, are GOOD FOOD, GOOD AIR, *good sleep*. The two first are the most important conditions, because if a baby has good food and pure air, good sleep will follow as a necessary consequence.

The case is far different with the baby who is born with some hereditary weakness. Here especial care is necessary in order that this particular defect may be overcome. It is a fact that very few such babies are born in the country. They are, in the very large majority of cases, the results of the deleterious influences of city life, and are to be greatly pitied, inasmuch as they are the unconscious sacrificial offerings on the altar of artificial life.

My statistics, in the end of this volume, will demonstrate that the majority of aged men now living in the

United States were born and reared in the country. They may have and many did remove to cities when nearing or having reached manhood, but their physical foundations were laid in the pure country. From this fact we can draw a very valuable lesson. If your baby, to your knowledge, inherits from either parent a predisposition to any weakness, you should, if possible, remove to and live in the country until your child has reached maturity or has surely thrown off this hereditary predisposition. It would be useless to dilate on (because common sense will make apparent to you) the fact that all the conditions of country life will insure to your baby a larger supply of pure air than the best city surroundings could furnish, and that, therefore, a residence in the country will in a great degree enable the delicate baby to throw off this weakness and to become a vigorous man or woman. This is a proposition that no intelligent physician will deny. God made the country, you must ever remember, while the city is the artificial work of man. God's handiwork is always better than that of man. There can be no question whatever as to the advisability of raising children in the country; all of you admit this when you rush off to the seaside or the country in the hot days of summer; but it would be infinitely to your baby's advantage to live permanently, the year round, in the country. In these days of rapid transit the distance from business is not a valid excuse. I have known many laboring men, doing work in Philadelphia, to live in the surrounding country, six or seven miles out. The steam cars, for a few cents and in fifteen minutes, land them into the very heart of the city.

It would be a grand step forward in the march of sanitary progress, and would conduce greatly to healthy long life, if human beings could be induced to abandon cities as places of residence. It will ever be necessary, of course, that men shall congregate together for the purposes of business; hence large cities must exist. But it would be a grand thing if all men would live in the country and come daily to the city, transact their business, and return to the country at night.

There are so many sources of air contamination to be found in large cities, that to one who considers the subject from a rational and intelligent standpoint, it would seem that it must be very exceptional to have babies grow into strong adults, when their whole lives have been passed in the city. By living in the country, as I suggest, your family will have the great advantage of using pure air all the time, while you yourself will be enabled to pass more than half your time in this life-prolonging atmosphere.

The process of hardening to which I have referred can be much more effectually carried out in the country. How few persons in the city keep a horse and carriage; and it would be very wrong to send your children out to walk on the wet, sloppy days of winter. But in the country it is the rule for nearly all persons, even those in very moderate circumstances, to have a horse and wagon; they are necessities of country life. So that no matter how inclement the day may be, you can bundle yourself and your children up warmly, close the curtains of your wagon and go for a drive, without the slightest fear of subsequent wet feet and colds.

Hygiene and the laws of health are more carefully

observed by Friends than by any other sect. Some of the doctrines of hygiene even constitute dogmas of their religion. With much pleasure and admiration, I have carefully observed them. Old age and good health are the rules and not the exceptions among the strict Friends. Did you ever see a *dirty* Friend? If you have, you have seen a curiosity that I have yet to encounter; yet, though not belonging to them, I have been born and bred among them. But the point I desire especially to make, is that the majority of Friends, hereabouts at least, live in the country.

When a stock breeder desires to raise blooded horses, he most carefully selects his farm. He intelligently looks for all surrounding conditions that may influence the growth and development of his young colts into strong, healthy and fleet horses.

The same amount of forethought, at least, ought to be expended in selecting the surrounding conditions that are to influence the growth and development of your children. So, if you desire to know how to surround your children so as to conduce to their long and healthy life, I will tell you.

Live in the country; select a healthy location, give them all the fresh air you can, and furnish them plenty of good food. In the chapter on "Our Houses and Grounds," I will tell you how to choose a healthy location, and how to secure a healthy home.

If possible, a baby ought not to be weaned until it is a year old. The very best nourishment for the first year of life is breast milk, and there is absolutely no adequate substitute for it, when it can be obtained pure and wholesome. The best proof of its efficiency or

deficiency, the *experimentum crucis*, is to be found in the effect that it produces on the baby. If the infant seems in good health and grows well, then you can rest assured that your milk is furnishing to it ample nourishment. But, if after carefully observing the directions I have already given about nursing, your baby does not seem vigorous, it looks pale and flabby, does not sleep well, and is constantly peevish and irritable, crying, whining and fretful nearly all the time; and if you are giving it absolutely nothing but breast milk, then you can positively make up your mind that one of the three following conditions is the cause of the trouble. 1st. Baby is sick. 2d. Your milk is deficient in quantity; or 3d. Your milk is of poor quality. To accurately determine which one of these conditions exists, and to decide the cause of the trouble and rectify it, will require the services of a physician.

Science has accurately determined the healthy formation of human milk, and has furnished to the physician the necessary means to determine the standard of any given specimen. If, upon examination, he finds your baby perfectly formed and thoroughly healthy, he will inquire into the quantity of milk furnished from your breasts; if they are well developed, and there is no doubt that you have a copious supply, he will conclude that the trouble must be found in an inferior quality of milk. Any farmers who may read this book already know that the quality of milk furnished by different cows will vary greatly. So it is with women. A woman in perfect health may, for some reason, for some peculiarity that we cannot penetrate, furnish an abundant supply of milk, but it may be lacking in some

ingredient necessary to furnish proper nourishment to the baby. Having excluded the two first points, a careful physician will procure a quantity of your milk and will subject it to analysis, whereby he will be enabled, by comparison with the normal standard, to decide in what particulars it may be deficient. When he has made this discovery, he will recommend a certain diet that will be calculated to supply the deficiency. If this fails to bring the milk up to the standard, he will then be compelled to recommend either, 1st, artificial feeding, or 2d, the employment of a wet nurse.

The first resort I deem preferable, for the following reasons: Various diseases can be conveyed to the child through the medium of milk from a woman who is not perfectly healthy. It is next to an impossibility for any one to say, even with the most careful examination, that a woman is absolutely and perfectly healthy. It is a fact that some disease may lurk in her system which cannot be detected by the most careful examination, even an analysis of the milk failing to reveal any unhealthy condition of this fluid. Yet this diseased condition of her system may be communicated to the baby through her milk. Of course, in the majority of cases, a properly conducted examination by a competent and intelligent physician will be capable of determining whether the prospective wet nurse is perfectly healthy or not, but such exceptional cases as I have referred to do occur occasionally, and in a matter so important as the feeding of our children we cannot afford to run any risks.

I would never employ a wet nurse with my own children, but would much prefer to resort to artificial

feeding, if, from any reason, the mother should be incapacitated from nursing them. Asses' milk approaches more nearly woman's milk in composition than that of any other animal, but since it is so difficult to procure, we must, in this country at least, fall back on cow's milk. The following table will show the relative composition of woman's milk and cow's milk:—

	<i>Woman's Milk.</i> <i>Per cent.</i>	<i>Cow's Milk.</i> <i>Per cent.</i>
Water - - - - -	88.9	86.4
Casein and Nitrogenous Compounds - -	3.92	5.52
Sugar - - - - -	4.36	3.8
Fat - - - - -	2.66	3.61
Salts - - - - -	0.13	0.66

When preparing cow's milk for infant food the object in view is, to bring its composition as nearly as possible to that of the woman's. You will notice that cow's milk contains more fat than human milk, therefore, the first step must be to let the milk stand until some of the cream has arisen, and to remove some of it; not all, however; this will reduce the quantity of fat, and bring it nearer to the human standard; by shaking, the remaining fat will be mixed throughout the milk. You will notice that cow's milk contains less sugar than woman's; therefore, you must add some sugar to it. If you are wealthy, it would be better to use sugar of milk for this purpose, which you can procure of any good druggist; if not, use the purest sugar you can find. About one teaspoonful of sugar added to each pint of milk will bring it up to the proper standard. You will notice that the nitrogenous or flesh-forming elements are in excess in the cow's milk, while the proportion of water is less than in human milk. In order to reduce these strong elements, and bring up the standard of liquid, you must add water. This will so dilute the nitrogenous ingre-

dients as to reduce the relative proportion which they hold in pure cow's milk. At first you should use one-third water and two-thirds milk. As baby grows older you can gradually reduce the quantity of water, until, when six or eight months old, you may use the milk pure or nearly so.

These directions are certainly very simple, and can be very easily carried out. Now, mark my words well, and take them seriously to heart; if you give baby *pure* cow's milk *at first*, in the very large majority of cases, you will derange the stomach and interfere with nutrition. To sum up, then, in order to bring cow's milk to the standard of human milk, and to thoroughly fit it to nourish the baby, you must go through the following processes:—

1. Partially skim it.
 2. Add one-third water.
 3. Add one teaspoonful of pure sugar to each pint.
- The difference in the proportion of salts is so small as not to need consideration.

If you live in the country, and have a young baby, you must realize that a *cow* is as important as a dining table. If you have your own cow, you know that you are getting pure milk, and you must be very careful how you feed this cow. The food of a cow from which you derive the nourishment for your baby should be as carefully selected as the food of the mother would be were she nursing the child. Slops and kitchen garbage should be kept far away from the manger. The same rules in regard to regularity and quantity of feeding will apply to the use of cow's milk as were indicated in the remarks on natural feeding.

It will now be in order to say a few words about that "AWFUL NURSING BOTTLE." It is a necessary adjunct of artificial feeding, that can be made productive of very much disease, but that *need not* excite the slightest uneasiness. In the first place, *long rubber tubes* must be banished, since it is utterly impossible to keep them thoroughly clean. In their place should be used a plain rubber nipple. Any kind of a bottle will answer; you need not go to the expense of buying any particular kind; use any that you have on hand. There is only one important rule to be formulated concerning the care of the nursing bottle, which, if faithfully carried out, will render it perfectly harmless. I mean *scrupulous cleanliness*. The very large majority of summer diseases, of deranged stomachs, and of sore mouths, that occur among artificially fed babies, are the direct results of dirty feeding bottles. How foul a neglected bottle can become, I need not go into arguments to prove; one experiment, which you can easily perform, will, I am sure, so convince you, that forever thereafter a dirty bottle will be an unknown nuisance about your premises.

Take a half pint bottle and fill it with pure milk; after an hour pour off the milk; you will notice that a very small quantity will adhere to the inside of the bottle, making the glass slightly cloudy; stand it aside for two or three days and then smell it. If it does not knock you down, you will have the strongest nose and the poorest sense of smell of any individual I ever met. The *smell* of this rotten milk will make you sick at your stomach; think, then, what a bad effect its ingestion into the delicate system of a young infant must have.

In order to avoid this danger, you ought to have two nursing bottles. When you fill one and give it to the baby, put the other into a strong solution of soda, in *pure boiling* water, and let it remain there until you require it. Then remove it, and before filling with milk, rinse it out four or five times in *boiling water*. Then put the other bottle in a *fresh soda solution*, and so on, all the time.

It is not necessary, neither do I consider it advisable, to heat the milk, because you may use a little too much heat, and coagulate the albumen, which renders it difficult of digestion. If you rinse the bottle, as I have told you to do, in boiling water, it will be warm enough to take the chill off the milk, and to heat it to just that degree that will be pleasant and acceptable to the baby's stomach.

You now have the main points, indeed, all that is necessary, in order that you may understand how to properly feed a baby with cow's milk; you require pure milk, brought up to the standard of human milk, and a clean bottle.

Some persons will be unable to procure pure, fresh cow's milk, for various reasons. Such may substitute condensed milk. I have known many fine children, who have been raised on this article; indeed, I have myself as stout, strong and healthy a little girl as you will see in a day's walk, who was fed from her third month, all through the first year of life, exclusively on the "Gail Borden, Eagle brand" of condensed milk. The fresh cow's milk is better, when it can be procured, but the condensed form makes a very good substitute when the former is unattainable. The same precau-

tions are to be observed in the use of the condensed as with the fresh milk. I would advise you to commence with about two teaspoonfuls of the milk to half a pint of hot water. Dissolve it thoroughly. If this mixture is too rich for the stomach (which will be evidenced by vomiting) reduce the strength, or if it does not seem to furnish enough nourishment, increase it.

Almost all babies and young children are costive; the very nature of their food tends to make them so, since milk is very binding. If this condition exists, it should be overcome, because convulsions and other disordered conditions are very frequently produced in the baby by constipation; besides which a costive habit may be established, which, extending into after life, will be very difficult to overcome. Simple measures may be resorted to by the mother to overcome this condition, without fear of harm. Every day at the same hour the following procedures may be resorted to: Roll a piece of stiff writing paper into an old-fashioned lamp-lighter, smear the small end with soap or oil, and *gently* introduce it into the bowel for a couple of inches. Let it remain in position. Generally this paper will sufficiently stimulate the bowel to cause it to contract, when the lamp-lighter will be expelled, and will be followed by a good passage. If this proves insufficient, procure a small hard-rubber syringe and daily inject into the bowel about three or four tablespoonfuls of olive oil. As an aid to these, you may frequently, throughout the day, gently but firmly rub your hand many times all over the abdomen or belly. If these means fail, and baby is very costive, you had better consult your physician.

Although I have said much to impress upon you the

necessity for care and intelligence in the management of babies, yet the necessary rules for their guidance can be expressed, when distilled into their essence, in a few words. From what I have already said you realize that the major portion of a young infant's life is, according to nature, passed in eating and sleeping. These are the two prime and essential conditions of healthy growth. Therefore, a baby must sleep well and eat well. If it eats well, it must, perforce, sleep well, since there will be nothing to interfere with the natural sleep. So that, to boil it down to the finest point, a *baby must eat well*; it must be properly fed. You now know how to do this; therefore, if your baby is healthy, by following the advice given, your baby will sleep well, and will grow and develop correspondingly. If you follow these directions strictly, and your child does not seem to be in good health, seems peevish, fretful and irritable, does not sleep well, and appears weak and languid, then you can make up your mind that baby is sick, and it becomes your duty to consult a physician.

There remains now only one important point in connection with young infants, to which to draw your attention—*clothing*—and it can be dismissed in a very few words.

As you will understand when we reach the chapter on "DRESS," clothing of all kinds is intended to protect the body from external cold. Its purpose is accomplished by retaining within the body the heat that is there generated. This indication is to be our guide in dressing the baby. I will enunciate the one rule that, in the baby as well as in the adult, flannel should be worn next the skin. After this, your own common

sense will be the guide. Remember, that if you dress baby too warmly, you will make it like the hot-house plant, liable to take cold on the least exposure. While it would be better to strike the happy medium, yet it will be wiser to dress the baby too thinly rather than too warmly, since, by erring on this side, the hardening process to which I have referred will be facilitated, while the danger of making it a hot-house plant will be avoided. The object to be attained in dressing, even on the coldest days, is to protect the delicate surface of the skin from the power which the cold air has to extract the heat from the body. But you must be very careful not to dress baby for out-doors, and then let it wait, all muffled up, for ten or fifteen minutes, while you dress yourself. If you do, it will feel the cold when it goes out nearly as much as though you had failed to put on any extra clothing.

Therefore, do not put on baby's extra wraps until you are just ready to send it out, and be particular to remove them the very moment it reënters the house.

You must be particularly careful not to allow soiled clothing or wet and dirty diapers to remain about the room in which you keep your baby, because all refuse matter, whether it be the water or urine, the contents of the bowels, the dead skin or any other human excrement, is organic; it undergoes decomposition, and in every instance the decomposition of dead organic matter is attended with the formation of elements injurious to health; therefore, if the dead, cast-off or injurious matter, of any kind whatever, from the human body is allowed to remain in the room, it will poison the atmosphere that the baby breathes. It is, then, of

the utmost importance that all passages from the bowels, as well as all soiled diapers, even though they be only wet, shall be immediately removed from the room. The bad practice of hanging a wet diaper before the heater to dry, and re-applying it to the poor little, innocent, helpless baby, cannot possibly be too strongly condemned, and I will tell you why. The liquid that has soiled the diaper is a watery solution of some of the dead, poisonous and injurious elements that have been removed from the baby's body; ingredients that would have fatally poisoned the body, if allowed to remain therein. When you hang this wet diaper over the back of a chair before the heater, see what happens: The heat causes evaporation of the water, and with it some of the solid ingredients, which, floating in the atmosphere, are inhaled and breathed into the lungs, and thus in a poisonous condition reënter the body from which, but a few minutes before, they have been discarded as unfit to remain. When dry, the diaper is oftentimes re-applied to the delicate skin of the baby. It is thoroughly impregnated with these poisonous ingredients; is it any wonder, then, that so many babies are sore or excoriated about their fundaments, when these irritating diapers are constantly applied and re-applied to their sensitive and delicate skin?

To avoid this, all soiled diapers should be immediately removed from the room, and THOROUGHLY WASHED, AND THOROUGHLY DRIED, AND THOROUGHLY AIRED, before being re-applied.

When teething, babies are particularly liable to have convulsions or spasms. If your baby is ever thus

affected, put it immediately into a hot bath, give it a large dose of castor oil and send for the doctor.

If, now, you will carefully and strictly follow the directions given in this chapter, you can depend upon it your baby will prosper ; it will grow and develop, as nature intends that it shall ; and without any trouble to you, it will gradually and insensibly pass into the little girl or boy, the care and management of which I shall briefly outline in the next chapter.

CHAPTER III.

HOW TO CARE FOR CHILDREN AT HOME.

There are certain general principles or fundamental doctrines that apply equally to the infant, the little child, the youth, the adult and the old man. The necessity for regularity in everything, for good food, air and water, sleep and exercise, are fundamental principles applicable to all stages of human life. But in addition to these, there are certain specific rules necessary for the various ages.

If it is well for a baby to be taken to and live in the country, it is equally as essential for the little child. Here it can romp and play, from morning until night, in the pure invigorating air; its little lungs and body will be constantly filled with the purest elements, while its good appetite, digestion and sleep, with its rosy cheeks and general appearance of robust health, will amply testify to the truth of my statements and to your wisdom, if you select a country home for your children. You must ever keep in your mind the fact that your children are not only growing on the outside—that is, their growth is not confined to their legs and arms, and the visible parts of their bodies—but that all their internal organs are growing and enlarging as well; therefore, they must have plenty of room, else, logically, their free development will be interfered with. You all would justly condemn the custom prevalent among the Chinese, of forcibly interfering with the growth of their

children's feet, by tightly bandaging them, so that they cannot possibly develop. Since this process is very painful to the little innocents, you would not think of resorting to it, although it results in increasing the personal beauty of the man or woman by securing to them small feet. When you interfere with the free growth and development of the internal organs, it is true that you do not cause your child to suffer any very great pain for the time being, but you do produce worse results.

A light load can be pulled by a light horse, while a heavy load will require the additional efforts of a heavy, strong horse. The refuse matter of a small city can be removed in a *few* SMALL carts, while that of a metropolis will require many LARGE ones. So the necessary vital functions of a little baby can be performed by small organs, but as the baby becomes a little child, the child a youth and the youth an adult, it is but reasonable, and you will readily believe, that the demand upon these organs will become greater, in proportion to the increase of the bulk of the body at large, and that in order to meet this demand, the organs themselves must increase in size, in proportion to the growth of the body. The liver, heart and kidneys of a man must be larger than the same organs in a baby; this you all are ready to concede. Now, let me tell the farmer that if he were to take a young calf to the blacksmith and have made an iron mould to fit one of its legs, which he kept constantly in position on this leg, in time the calf would become a full grown cow, but this particular leg, the growth of which had been forcibly retarded by the iron case, would forever remain the diminutive leg of

the calf. The cow would be thoroughly developed in every other particular, but it would have one very small leg. After the full development of the animal had taken place, he might remove the iron case, but the leg would get no larger, since the period during which growth occurs has passed by, and the time has come when the processes of growth and decay having become equal, no part can increase in size. The same result would be produced by the same means in the human being. But when this forcible restraint is placed upon the growth only of a limb, it need not necessarily interfere with the general health of the animal to any serious degree, since these limbs or external parts are but portions of the machine about which I have already told you, whose duty it is only to make visible the power generated by the intimate portions of the machine, and to so utilize this power as to make it potent in the consummation of the phenomena of human individual and collective life. But they do not have any important participation in the production or originating of this force.

But if the same method of forcible retardation of development of the *internal* or *vital* organs should be allowed, the results would be far different.

This unnaturally diminutive liver or heart, lungs or stomach, would be unable to do their full duty in production of the necessary conditions to sustain the inherited vital force or power, and, as a logical sequence, it would become prematurely exhausted.

The *skull* has been made by nature for no other purpose than to protect the brain within it from external injury; the ribs are likewise intended as a protec-

tion to the heart and lungs. Were it not for these hard, bony coverings, the vital organs inside of them would be so exposed that it would be almost impossible to preserve them from fatal injury or to have living beings at all. If you had no skull, every time you put on your hat or laid down, even with your head on a soft pillow, your brain would be subjected to a certain amount of compression. If you had no ribs to protect your heart, every time you jostled against a man on the street you would be liable to rupture this vital organ, while without this same protection your lungs would be so compressed every time you laid down that no air could possibly enter them. In a word, the bony coverings of all your vital organs are intended by nature as a protection to all these organs. They grow in proportion to the general growth of the body, and thus allow the organs within them to enlarge; and this teaches us the valuable lesson, that compression of any vital organ is inimical to health and long life.

Thus, then, you understand that it will be injurious in after life, if you interfere in any way with the free growth and development of any vital organ.

There is one way in which the organs of nearly all children are hampered in their growth, namely, by improper dressing. There ought to be nothing *tight* about the body; every article of clothing should be so loose that you could easily insert your fingers between it and the body. Let this be your rule, and compression of the vital organs will never occur.

When making a suit for your little boy or girl, after you have taken his measure, have the clothing made a size larger than the measure calls for; then you will be

on the safe side. All clothing should be suspended from the shoulders, instead of being made to constrict the waist, and thus be prevented from falling down. Too much stress cannot be laid on this point, since it is absolutely necessary that the vital organs should have plenty of room to expand and grow.

Young children, like little kittens, must play, play, play. For heaven's sake, do not commence to cram their little heads with learning as soon as they are able to walk.

You must realize, once for all, that every act performed by an animal, as a result of its performance, uses up some of the vital power. The principal duty of a child's life is to grow and develop. The performance of this duty makes great demand upon this vital force, and it ought not to be diverted to any other purpose. If you attempt to develop the mind at the same time that nature is developing the body, you are making, as you can clearly understand, an unnatural demand upon the stock of vital power, and it will prematurely exhaust it. As a proof of this statement, you must remember that in the majority of instances remarkably precocious children die young, showing that the mental portion of their organization has developed at the expense of the physical; while among men who have attained great prominence in learned pursuits, and have lived to great age, we find that the largest number of them failed to evidence any remarkable intellectual development until long after youth had passed, and they were well advanced into the stage of maturity. It seems only natural that this should be so, and a belief in it ought to be engendered by common sense.

I will illustrate this point familiarly. The physical development of the child might be compared to the building of a house, while its intellectual training may be likened to the ornamentation of the same. When a wise and careful builder desires to erect a substantial and lasting edifice, he goes about his work with judgment. He does not attempt to do all at once, but completes his work by degrees. He first carefully lays his foundation, upon which he erects the superstructure, and when the building is finished he plasters it all inside and waits. For what? Until his work has settled and become established, as it were. When the plaster has thoroughly dried, he commences the work of ornamentation. Frescoe painters and other artists are put to work, and the result is that in time he has a handsome and substantial house that will remain so for a long while. But were he to hurry it up, were he to complete it all at once, to put decorators on plaster scarcely dry, in a short time the plaster would crack, the paint would peel, his building would settle, and in a few years, what ought to have been a handsome house will be but a tumble-down and dilapidated structure.

So with the child. If you are careful to first secure a sound physical foundation, you can then, with confidence, erect upon it a superstructure of intellectual development that will be a pleasure and a comfort to your child, yourself and the world, and will be lasting; while if you attempt to do both at the same time, to develop the physical and mental being, you will surely make an abortion of both.

You may, it is true, like the contract builder, produce

a meteoric child ; one that will for a brief space startle your neighbors by its wonderful precociousness, that will truly seem a marvel of brightness, intelligence and acquisitions, but in a very short time such a *forced* child will collapse like a balloon, and will become a physical wreck shortly after he reaches manhood, or even before.

You all know that it is possible to force a plant into bloom, but you also know that such plants are weakly and their lives short. Intellectual development might be compared to the fruit of such a plant ; it can, by artificial management, be produced unnaturally soon, but the child from which such unwilling results are unnaturally forced will be robbed of its strength, and will perish prematurely.

It is also a fact that the greatest physical development, and the largest number of instances of long life, are to be found among the savages, who live strictly in accordance with the teachings of nature, and obey her instinctive mandates, since they know no other teacher ; while among the haunts of civilization we note the very large majority of aged persons among those who have in their youth enjoyed but limited facilities for mental culture. While, on the other hand, we encounter, among the many demoralizing results of artificial city life, numberless instances of puny, weak-limbed, pale, diminutive young men, with their heads crammed full of Latin and Greek, their mental development well advanced, and their weak, neglected bodies insured for an early death.

Children brought up in cities are "in the way" when they reach a certain age, and to get rid of them

parents often send them to school much sooner than they ought to; while in the country, to get rid of them, to get them "out of the way," they will send them out to play, to breathe pure air, to exercise their little bodies, and to lay a solid foundation upon which to rest the subsequent mental adornment. I do not mean to condemn education; far from it. Upon mental culture rests the perpetuity of our government and the happiness and progress of the world. But I do desire to impress upon you the necessity of endeavoring to arrive at the happy medium—neither to allow the physical development of your children at the expense of their mental culture, nor their intellectual training at the sacrifice of their bodily health. The one can occur; the other cannot, that is to say permanently. By devoting every effort to developing strength, you can make a kind of ox out of a man. You can make him a marvel of physical strength and endurance, and he will have about as much intelligence as, and most likely less instinct than, a well bred ox. But you cannot develop a masterly mind in a weak body. You may for a time, as I have said, produce mental phenomena of a most startling and wonderful character, but if you do so at the expense of the body, they will not be permanent, simply because the machine from which and in which they are generated cannot last; the body is weak and will die.

Which would you prefer; a son or daughter who at seven was considered very smart, at twelve a prodigy, at twenty-five a brilliant man, and at thirty a corpse, or one who throughout childhood was considered only an ordinary boy or girl, *who cared more for play than*

for study, who disliked school and hated school books, who took every opportunity to play "*hookey*," and wandered off into the country to fish, or swim, or skate, or indulge in some occupation calculated to improve his physical being; who at ten or twelve was almost a mental booby, but a physical beauty; at fifteen commencing to study; at twenty knowing less than the prodigy had forgotten at twelve; at twenty-five still studying harder than ever; at thirty commencing to be known as a student and an able man, still possessing vigor and strength of body; at forty a man in his prime, mentally and physically, a pride to you (his parents) and one whose friendship would be sought by great men; at fifty a distinguished savant, whose name is known, and whose wisdom and learning are quoted the world over; at sixty receiving the homage of mankind, becoming an invited member of learned societies throughout the world, and having a thoroughly established and recognized position among the great men of the day; at seventy to be called a magnificent specimen of manhood, who has, by earnest and judicious labor, by his accumulated wisdom and experience, by his well spent life, benefited his fellow creatures; and finally, at seventy-five or eighty to quietly and peacefully pass away, with the whole world sounding his praises into the ears of a devoted family, with the universal literature of the globe holding up his life as an example to young men, and with his learned achievements left behind as eternal and indestructible monuments to his earnest and well lived life Say, which would you choose for your children?

Such great names as Edgar Allen Poe and Byron

are illustrations of our first proposition, while the second is represented by John Hunter, and will, I am sure, be borne out by the future career of Dr. J. Milner Fothergill, of London.

Of John Hunter, his biographers charitably say, that in his early days he was but little inclined to study or serious pursuits. In truth, he was wild and wayward. When reaching maturity and commencing to realize the real purpose of man's creation, with a developed body, he commenced the culture of his mind. For years he labored; the physical case containing his mind did not longer need his attention; it was fully formed and developed; thus he was allowed to expend all his efforts toward mental expansion, without hindrance from a body weakened by premature intellectual labor.

The result was, that John Hunter died an old man, a distinguished man, one whom Professor Gross is pleased to style the "Father of Scientific Surgery."

Dr. Fothergill, in his youth was such a lad as Hunter; when reaching maturity, with a strong and vigorous body, he too commenced to realize the necessity of mental development (as all children born of intelligent parents will, sooner or later), and applying himself with a force only possible to be produced by a mind that resides in a vigorous body, he has already done work that promises surely to make his name famous, and to secure for him an impregnable position among the great men of his day. It is an admitted truth that the two portions of mankind, the physical and the psychical, or the mental and the bodily, must be equally developed to insure the most perfect type of manhood. It is equally true that the body can be

developed and live to old age with but little development or training of the mind, but it is impossible for the intellect to have a long life unless it resides in a healthy body.

From what has been already said, you can understand the reason for this; you can realize that in order to secure a long, healthy and useful life, to accomplish the greatest possibilities of which your children are capable, you must first secure a good physical foundation and subsequently decorate it with mental ornamentation.

By pursuing this course, not only will your child develop into a physically strong man or woman, but when the seeds of mental culture are finally sown, they will grow more rapidly and much more luxuriantly, producing a bountiful harvest; much more so than if planted prematurely, since then they will be planted in mature soil, ready and anxious to receive them, and capable of thoroughly developing them.

But how can you accomplish these indications? Very easily. You must keep school books of all kinds away from your children until they are well advanced in years. I would deem it much better for the general interests of the human race, if no child was allowed to go to school before the age of ten or twelve years. Of course, no absolute rule can be laid down for this question, since some children will be as far advanced physically at seven or eight as others will be at ten or twelve years of age; but for your guidance, it will be safe to say that if your children are robust, and strong, and hearty, they might be sent to school when nine years of age; but if at all delicate, their physical devel-

opment ought to predominate until they are fourteen or fifteen years of age. This will seem strange advice until you have proved its wisdom by experience, and you will be very loth to have your children grow so large without having commenced their education, particularly when you see them surrounded by many other children of their age who are far in advance of them in intellectual attainments. But, if you do follow this precept, you will, in the end, be much gratified to see your child rapidly overtake and pass the one who has commenced so much earlier, and when they both reach manhood, to have yours a *strong*, learned man, with bright prospects of many years of active life before him, while the young prodigy is a weakly individual, full of learning, (though not more so than your own), but evidently doomed to an early death.

There comes a time in the life of every individual, known as the "*period of puberty*." This marks the passage of the individual from the days of childhood into those of youth. It is the period of appearance of the bud that will subsequently blossom into womanhood and manhood. In the girl, the advent of this period is distinctively noted by the establishment of the monthly sickness, while in the boy there is no such characteristic change, but he seems to become more manly in every particular. His voice becomes deeper and more masculine, his mental faculties are commencing to develop and to be directed into individual channels. He seems now, instinctively, to realize the difference between the sexes, evidenced by the fact that, while hitherto he has been perfectly willing and contented to play indiscriminately with boys or girls, to amuse him-

self with pleasures common to both, he now seeks the company of boys, and becomes diffident and bashful in the presence of girls. Without knowing or realizing it, his mind is now receiving the impression that there is some fundamental change taking place within him; he feels that a barrier has arisen between his present and former life; he knows that he is a different being from what he was but a short time before. And he really is. Up to this time, both the boy and the girl have been merely human animals. There has been no real difference between them. If we except the few differences in internal and external anatomy, they have been identical. Their thoughts, desires and amusements have been the same. But now a wonderful change takes place. The boy becomes distinctively a boy, and the girl a girl. The differences that become so marked in adult life now commence to manifest themselves. They are no longer one common type of animal life, but thereafter they will constitute two distinct species, with thoughts, desires, emotions and functions widely divergent. A certain amount of reserve will now take the place of the former unrestricted intercourse, since each sex will instinctively feel that an indescribable barrier has arisen between them, to be bridged only by the greatest courtesy and respect. This embryonic sentiment will gradually develop, until in adult life it assumes such proportions as to cause the relations we all know to exist between the male and female.

At this point the stream of human life which has hitherto run but in one channel, now meets the "*rock of puberty*," an island very narrow, it is true, but as long as life. Against it the stream of childhood beats, and

is divided into two, one flowing toward the bay of manhood, the other to the sound of womanhood—points widely divergent, but connected together by the isthmus of society and social intercourse.

The "*Isthmus of Society and Social Intercourse*" really means the marriage tie, which alone can bring back the man and woman into the relations or intimacy akin to that previously existing, before puberty, between the boy and girl. The marriage ceremony makes man and woman *one*, and while, of course, their distinctive characteristics still remain, yet by this union they are brought nearer to the pre-puberty relation of the sexes than they ever can be by any other means.

When this period arrives, the natural mental development of children commences. They view surroundings from an entirely different standpoint than from any that have previously influenced them. As children, they accept their conditions as naturally as any of the lower animals, and give them no thought, since they are incapable of thinking.

But now, having reached this age, their bodies are sufficiently developed to allow their vital force to divert some of its power toward the hitherto dormant intellect. They now commence to think and reason ; they now require to satisfy their intelligence with some reason for every act they perform. This, then, is clearly the time at which their intellectual development ought to commence in earnest. This is the time to send them to school, without fear of injuring their physical welfare. This period usually occurs in the girl at from twelve to fourteen years of age, and in the boy at about the fourteenth or fifteenth year.

I fully realize that this teaching is altogether antagonistic to the prevailing customs of our country, and it is for this reason that I have written this chapter. My labor would do you no good, if I were only to tell you what you already know; but when I discover errors in existing customs, I flatter myself that I can benefit mankind by pointing them out, and demonstrating how they can be remedied.

Therefore, I would enunciate the rule, that the human race would, in the long run, live longer, be healthier, and represent a greater collective amount of intellectual development, if children were kept away from school until they reach the age of puberty.

I do not mean that mental education ought to be absolutely avoided until that period; far from it. Mothers and fathers must realize that they owe to their children other duties than merely feeding and clothing them; in fact, as I have already intimated, their whole time, almost, must be devoted to their children, if they desire to develop thoroughly all the possibilities within them. Therefore, the parents must, during childhood, give some little time, at least, to the education of their children.

Education really consists in developing the mind, by imparting to it the knowledge acquired and possessed by others. This can be done, in the case of young children, in such a way as to make it pleasant to them and easy to the parents.

Suppose you set aside one room in the house for the nursery. I would advise you to leave the walls bare of any paper at first; occasionally, when you happen to meet a bright colored and attractive picture of a horse,

a cow, a dog, a camel, a cat, or any other animal, paste it up on the wall. Do the same with figures. Cut out the large red and blue letters from circus handbills and paste them on the wall. In some portion of the room hang a large card, with the alphabet, in bright, large letters, on it. Hang or paste on the wall all the large colored pictures you can procure. Make for the floor a padded, quilted covering, and on every available inch of it sew some attractive picture; endeavoring to have represented, in bright and striking colors, every object in nature.

These striking colors will make an impression on the little child; they will attract the eye and invite questions and thought. Oh! see, mamma, the little four year old will exclaim, pointing to a large, red horse, or a blue cat, or a large yellow A; Oh! look, papa, to a green tree, or a white sheep, or a pink D; a few words will suffice to explain and impress upon the innocent little mind the nature of the subject that has attracted it.

It would occupy but a few minutes for the father or mother to take the little child by the hand, and walking around the nursery, point out to it a large A, then a B, and a C, and so on through the alphabet. I am sure that five or ten minutes a day so occupied would, with a child four years old, result, after a few months, in it being able to repeat the whole alphabet and to point out any particular letter.

Then, when the picture of any animal or any particular object attracts the child's attention, a few plain and easily understood words about the nature of this object will make an ineffaceable impression. When

the child is able to point out quickly each letter, it will be well to confine your explanation to the card containing them in rotation, when, in a short time, your little child will be able to go through the whole alphabet .

To illustrate, suppose a red horse attracts the eye ; standing in front of it, point out to your child its head, its legs, its back, mane, tail, hoofs, in fact, all parts of it, then going to a picture of a colt, tell it that this is a baby horse, and that after a while it will grow into a large horse, just like the other one. Tell that the horse is strong and can pull heavy loads, that it is used to pull carriages with people in them. Then go to a picture of a carriage, and say this is a carriage ; there are the wheels, this is the door, this is the pole to which the horses are harnessed ; inside are the seats where people sit ; here is the seat for the driver, and so on." Then go to a picture representing a carriage with horses harnessed to it. Explain all parts of it. Thus, then, will your little child learn something about the horse and the carriage, as well as the relation that the one holds to the other, and all with but little expenditure of time and with no effort on the part of the child, but only a pleasant and agreeable few minutes, that, instead of injuring, will really benefit the physical development.

Again, you must remember that children are very observant ; you know that "*little pitchers have big ears* ;" little children indeed have, and hear much ; so that your conversation will tend to educate them. They will hear and remember much more than you imagine they do ; their little ears miss very little that is going on around them. Thus, by being careful and thoughtful

about the conversation used in their presence, you will help this preliminary education of their intellect. If you catch my idea, it will redound to your children's benefit ; in a few words, it might be said that the pre-puberty education of children ought to be confined to that inductive training which they receive from personal intercourse with those older and wiser than themselves. But receiving this instruction in the way I have indicated, a little at a time, and in a manner so gradual and so easy as to be scarcely noticeable, the strain on the physical system is almost absolutely nil, while the mental portion of the body receives from it only that gentle and healthful stimulus that will react favorably on the bodily vigor.

After a time, when the alphabet has been thoroughly mastered, you can hang in the room short words, and tell your children how to spell them. Suppose you have the word DOG ; you can cause your little boy or girl to first point out D, then O, then G, around the room ; then, coming to the combination of these letters, to the word DOG, he or she will be able to tell you each letter, to say D O G ; then you tell him that spells DOG, and devote a few minutes to a lucid explanation of what a dog is. First present the words in large capital letters ; subsequently familiarize the child with the same word in written letters ; thus will gradually become familiar to them the different kinds of letters. Then you can have a large blackboard and chalk ; upon it let the child first make the printed letters, directing his budding power by holding his hand. When he can, without assistance, print DOG, then teach him to *write dog*. This is used merely as an illustration, to

demonstrate to you how gradual ought to be the development at this tender age.

After the letters have been mastered and words can be spelled, it will be but a small, almost imperceptible and very gradual step, until your child can read.

Figures can then be taken up. When the child can tell you each figure as you point it out, and can make them on the blackboard, then can you commence with the simplest forms of addition, giving them such little sums to do as $\frac{2}{4}$, or $\frac{2}{6}$, or $2)4$ (2, and the like; when these have been mastered, you can go on to more difficult arithmetical problems.

Thus, by occupying only a few minutes a day, and by making it a labor of love, your child will insensibly become able to read and write, and become familiar with arithmetic.

How few parents take this little trouble; they seem to think that their duty is performed when they furnish a home, food and clothing for their offspring; while, when they think the time has come to train and develop the mind, they intrust this all important duty to strangers, who have no love for or interest in their children, and who do their work only because they are paid for it.

By this gradual and pleasant home education, ample time is afforded for the all important physical development without which the perpetuity of the subsequent mental expansion will be impossible.

When the child is able to read and write, you should procure a good supply of simple little books, containing only short and easy words; then encourage your child to read, and spend a few minutes in talking over

with and explaining to it what he or she may have been reading. By this means you will instill gradually into the little mind the habit of thought and reasoning.

By this gradual process, which I have only been able to outline, your child will reach the age of puberty with a very good knowledge of the fundamental principles of all learning ; *reading, writing and arithmetic.*

While pursuing these little Kindergarten studies, the child should be made to remain much in the open air, and particular care should be taken that it receives a sufficiency of physical exercise; how to accomplish this you will learn in the chapter on *Exercise.*

This course of intellectual training should not be made irksome to the child ; it ought not to be forced when it has not the inclination. If the child does not want to look at the pictures and hear your explanations you should let it do exactly what it does want to do ; you can rest assured that if you make the pictures bright and the explanations easy and attractive, sufficient time will be voluntarily and cheerfully occupied in contemplation and study of them to accomplish the desired purpose.

There is only one thing in the education of a little child that ought to be FORCED, and that is *obedience* ; but in enforcing it, you must use judgment. When you tell a child that it *must* do so and so, there ought to be no appeal ; no matter how much time and trouble it may cause you, you ought to persist until what you have ordered has been done. But you must be careful that you are directing the right thing before you take this determined stand. You must remember that children have an instinctive sense of right and wrong, and if they

feel that the parent is endeavoring to force them to do that which is to them instinctively wrong, they will oftentimes become openly defiant, when nothing short of physical force will compel them to fulfill your unjust commands, with the result that their respect and love for you will be lessened, as well as the diminution of your authority over them. In many cases these constant squabbles and wrangles for supremacy between parents and children will so annoy and irritate both parties as to redound injuriously to their physical welfare.

Therefore, it is much better to let your children have a "*free foot*," so to speak ; let them do pretty much as they please, unless they want to do something that is morally wrong, or that is clearly opposed to their physical welfare. Remember that some of the greatest men in this country have literally *brought themselves up* ; their infancy and childhood have been passed amid such surroundings that they were unable to receive much training ; indeed, I can assure you, that more worthless men result from *too much bringing up* than from too little.

Now, then, when the boy is, say fourteen years of age, he is well developed physically ; he has a thorough knowledge of the preliminary and absolutely necessary branches of education, learned from the kindest and gentlest of teachers. From this time the future education of the three different classes of society must diverge ; up to this time, all classes (except that in which the parents are absolutely illiterate) can be educated on the same common plan. It costs no money, and only requires some patience, perseverance and love on the part of the parent. But now

the time comes when the children of the rich will commence their ornamental intellectual development. With their good foundation and their fine physique, from two to four years with a private tutor, or in a good preparatory school, will thoroughly prepare them for the more complicated and arduous duties and studies of college life. So that, when sixteen years of age, they can enter upon their four years' course with minds sufficiently mature to enable them to realize and appreciate the advantages they are about to receive. Then at twenty they graduate, which is undoubtedly the proper age, for now they are prepared to take up some professional study. Suppose medicine is decided upon. A three years' course, with a term of one year as resident physician in a hospital, will bring them to twenty-four; this, followed by a two years' course of travel, study and observation, will bring back your son a finished and thoroughly educated gentleman, old enough to hope to obtain some practice at his profession. While, if *forced* through, completing his professional education at twenty-one, he will be sure to have some years of weary waiting, since no one will employ so young a man or *boy*.

With those in moderate circumstances, the preliminary school education will prepare the boy for *work* at sixteen. He can then earn his own living, but will have had the great and incalculable advantage of a fair general education. He will know enough to carry him successfully through any business career, while he will have a foundation upon which to erect a structure of more ornamental learning, should he be fortunate enough to meet with the business success that will afford him some spare time.

To the poor, the boy of twelve will have the knowledge that will raise him above the level of the brute creation. He can read, write, and has a knowledge of elementary arithmetic, with which he can be put to work, with the confident belief that his mind has been started into the right channel, and that in the majority of cases a desire for learning has been implanted that will cause him to seize every future opportunity of developing his intellect.

We have now brought our children up to the school period, when we can go on to the next chapter and discuss how to attend to them when that period has arrived.

CHAPTER IV.

HOW SCHOOL CHILDREN OUGHT TO LIVE.

When the boy or girl, but more particularly the former, reaches the age of puberty, he becomes to a certain extent an independent individual. The former complete reliance on his parents is now substituted by an instinctive independence. He feels that he has reached the age of reason, and that he is no longer the little child, to be absolutely and unquestionably controlled by another.

The period of unreasoning and unquestioned obedience has now given way to the power of thought and reasoning, and to the consequent independence born of these two faculties. He will no longer submit to what may seem to him to be unjust commands. This budding feeling of independence will be evidenced by his readiness for argument. You might tell a child of five that black was white, and he would believe it, since he would not be capable of reasoning otherwise; but if you tell a boy of twelve that he must not play foot-ball or cricket, when he sees all the boys in the neighborhood enjoying these games, he will be sure to ask the why and wherefore of your, to him, unreasonable command, and to argue its injustice with you.

Very few parents thoroughly realize the importance of this symptom in their children. They have been accustomed, from the hour of birth, to regard their offspring as they do their horses or dogs. They feel that

their will must be unquestioned and undisputed law in the household; the child must subordinate all its impulses and desires to theirs, as absolutely as does the horse. Everything must be done as they say. Therefore, when this natural independence commences to manifest itself, it is misinterpreted and construed as open and willful rebellion against parental authority, and must be nipped in the bud, before it gains strength and headway.

This is a fatal error into which most parents fall, and the sooner they realize it the better will it be for their future happiness. You must know that when your boy or girl reaches the age of puberty, he or she is commencing to be a man or woman, and if you wish peace in the household and a subsequently respectable and happy family of children, you must commence to treat them as such; you can no longer make babies of them; while, if you foolishly forbid them the society and rational pleasures of those of their age, you will, in the majority of instances, make them deceitful, since they will, in spite of you, enjoy the pleasures that the natural inclination of their age demands. The hitherto child must now be made a companion. Everything that you desire them to do, you must explain to them why they ought to do it. You should encourage discussion between your children and yourself, since this will tend to enlarge their minds, by imparting to them some of the information from your more mature minds. If now your children are going to school, it behooves you to be very careful in your selection of the school to which you send them. It will not be enough, and your duty will not be done, when you have ascertained

that the school is presided over by a learned principal and that the pupils all advance rapidly in their studies. You must once for all realize that while both health and learning are very desirable and to be sought after, yet the former is infinitely more important than the latter.

You should make a personal inspection of the school, and ascertain (by the means I will give you in the chapter on ventilation) whether there is a plentiful supply of pure air for all the pupils. It is necessary, also, that their desks and seats shall be so arranged that when doing their school work they can sit erect; if, as is so common, they are compelled to lean forward, with the shoulders high up, you can readily understand that the chest will be contracted, its free expansion interfered with, when the forcible interference with development of all the vital organs which I have already illustrated to you will be produced.

Nearly all the time outside of school hours ought to be devoted to exercise and amusement. I would not allow my own child, who was confined in school from nine in the morning until two in the afternoon, to study more than two hours, at the utmost, outside of school.

Our American school system is simply abominable. The idea of confining a little boy or girl for five or six hours, and then sending them home with studies for the next day that will require three or four hours of hard work, is brutal. This is strong language, but I deem it justifiable when applied to such an outrageous abuse as the ruination of the physical strength of these poor little children, whose future possibilities no one can foresee.

Let me detail my daily experience for four years at college.

At a quarter past five in the morning we were *forced* out of bed, in the coldest days of winter, with five minutes only for dressing; we hurried down from the garret (in which we slept) to the wash room in the basement; after a hurried washing in the coldest water imaginable, with our half frozen bodies still wet from the washing, we hurried across a yard, some two hundred feet, up to the third story, to our study hall, where our *elaborate toilettes* were completed. Then, at a quarter before six, we repaired to the chapel for divine service, and back again to study, on *an empty stomach*, until a quarter before eight, when we had breakfast. With twenty minutes' recreation, recitations commenced, and continued with three intervals of five minutes each, until eleven o'clock; a recreation of half an hour was followed by dinner. Then one hour's amusement was followed by one hour and a half of study, and recitations until five o'clock; then amusement until half past; supper, divine service and study until bed-time, at nine. This routine was varied two days in the week by holiday from dinner time until supper, followed by the regular evening study. The boys at this college were divided into two sets, according to their size, and the routine that I have furnished was for the larger boys, while that for the smaller was modified, by allowing them to remain in bed fifteen minutes longer in the morning, and to retire one hour earlier. The qualification for admittance among the large boys was that the candidate should measure four feet, five inches, no matter what his age might be; so that I

have known tall boys of fourteen to be subjected to the hardships I have described, a mode of life that would be calculated to undermine the constitution of a man. This was a first-class college, than which there were and are none better in the land.

The trouble is, that we desire to do everything too rapidly in this country; we desire to accomplish our ends in half the time that the older and more settled countries consider it proper to consume in accomplishing the same purposes. This is the natural outgrowth of the two facts that we have an enormous country to develop, and that we are constantly receiving accessions from other countries, who, anxious to make money, set to work with a feverish and unnatural haste, working, working, working, never ceasing until they have accomplished their purpose.

Unfortunately, this same evil of *hurry*, so characteristic of Americans, has found its way into the education of our children, and the desire seems to be to *force* them through their mental training as rapidly as possible, with the result that they are overworked; they *cram*, they forget half they learn, and when they get through are only half educated.

To illustrate: When a young man commences to study medicine, in this country, unless he may choose one of the few really first-class colleges, he is forced to study nearly all day long, and after two years of such crowding he receives his diploma. As a result, what he may have learned is but very imperfectly arranged in his mind; it is not thoroughly digested, and is soon forgotten.

In Europe, on the contrary, a student of medicine

will work, will read, study or attend lectures only for a few hours each day ; he will then devote himself to rational amusement. In Vienna, for example, a couple or more students, after a morning's course of lectures, will repair to one of the famous pleasure gardens of that wonderful city, and with pipe and a moderate quantity of beer, will sit and listen to delightful music, discussing, while sitting, the new points they may have learned in the morning ; thus each day's work is thoroughly digested and assimilated, and forms an integral portion of the intellectual being.

The case is similar to that of eating. If a man eats in ten minutes that which he ought to eat in an hour or two, and if he consumes very much more food than he requires, there can only be one result ; he must reject some of the surplus, and he must have dyspepsia, as a result of which his physical being is but imperfectly nourished.

So, if a student forces into his mind more mental food than it can digest and assimilate, some of it will be rejected and forgotten, while the psychical dyspepsia produced by this overcrowding will interfere with the proper nutrition of his intellectual being. This fact only bears out the rule enunciated in the chapter on "How to Work," that a lesser amount of judiciously performed mental labor will be productive of more ultimate good than a very much greater amount of forced mental acquirements.

Therefore, to educate as we ought our offspring, and to develop their physique as well, not more than four to six hours, all told, each day, ought to be devoted to mental culture. Physical growth is natural ; mental

training is artificial. In order that we may enjoy longevity, we must conform to nature, therefore, the natural duties or functions must subordinate the artificial.

When you desire to train a vine into any particular ornamental shape, differing from the position which it will naturally assume, you must handle it very gently, lest you may, by roughness or too much artificial interference, so hinder or retard its natural growth as to destroy its vigor. So when you endeavor to train the mental portion of your child into any particular channel, you must be careful, lest by doing so either prematurely or too vigorously you may weaken or destroy its physical vigor.

Thus, then, to sum up our advice on this question of education of the intellect, we would say, that the mental development of your sons and daughters ought to be very gradually and wisely conducted. Give them but little at a time, let this little be thoroughly stored away in the innermost recesses of the brain, and do not put in any more until this has taken deep root. Each wise thought, well planted, will grow vigorously, will give off many branches, and these same will bud, while from every bud will evolve some good fruit. But if hastily and imperfectly planted, these teachings will languish and die.

Mothers have a most important duty to perform. When their daughters reach the age of thirteen or fourteen years, and give evidence of the great change about to take place within them, it becomes very necessary that this important expected function should be explained to them. Many mothers, through a false

sense of propriety, will neglect to do this, and as a result the first monthly sickness comes upon their daughters unexpectedly, and in many cases produces a fright and shock to the nervous system that may prove very injurious. A few simple words will suffice to explain to the young girl all about what she has soon to expect, and will so prepare her mind that when it comes it will seem but perfectly natural, and will create no alarm.

At this period of approaching manhood the father should make a companion of his son; while guarding his conversation against any language that might tend to implant wrong or immoral ideas in the youth's mind, yet he ought to gradually unfold to him the duties he may have to perform in after life. This knowledge is generally received by young boys in an immoral and vulgar way, from those boys who are older than themselves; it would be much better were such information to be conveyed in the judicious, mature and careful language of the father.

Of course, you will all understand what I mean; the duties that your children will have to perform in after life, in perpetuating their species, are accompanied by ideas and mental sensations of two kinds. One moral, the other immoral. Unfortunately and wrongly, parents avoid these subjects, trusting, it would seem, to nature to acquaint their children with them. In this instance, nature is not a good teacher, since, as I have said, when left, as it usually is, to be learned as it may, it is usually communicated from older to younger boys. These older boys, not yet sufficiently developed mentally to understand this wonderful function in its true

and sublime aspect, view it only from the standpoint of immorality, hence they implant immoral seeds in young and innocent minds, which may produce very serious evil results before they are old enough and sensible enough to regard them from true and noble standpoints. But if, on the other hand, the father explains to the son, and the mother to the daughter, in chaste and well chosen words, the nature of the wonderful duties they will be called upon to perform in the future, these thinking young men and women will receive this knowledge and information from a *moral* standpoint, and instead of regarding it as a something merely to gratify and satisfy a base and animal passion, they will view it as a sacred and pure duty, by which *God's* creatures are perpetuated.

The whole impression which this information makes on the mind will be radically different, and the ensuing results will be wonderful ; the boy will repay this confidence and trust that is placed in him ; he will feel that you are regarding and treating him as a man, and he will be stimulated to act as such ; he will be put upon his pride, as it were, and you can rest assured that in the majority of cases this will be the best course to pursue.

When telling your son about these duties it will be well to picture to him the disastrous results of neglecting your good advice ; let him know all about the penalties of violating chastity in after life ; if you do not tell him, some one less competent will do so ; and he will then learn it in such a light, frivolous and apparently attractive manner, that very likely he will be drawn toward these very dangers, and will not realize

their magnitude until he has become their victim. It is a fact that in the large majority of instances the sinful and dangerous pleasures of life are presented to the young from a very attractive standpoint, their claws and poisoned fangs being hidden under the glare and blaze of pleasure, so fascinating to the young; but these masked enemies can and will bite, bite deeply, seriously and lastingly; they spare neither the young nor the old; all alike are subject to their evil influences. Those who are forewarned are forearmed; therefore, if the father will instruct and advise his young son, approaching manhood, and show him, in the true light of mature years, the almost inevitable consequences of unbridled enjoyment of these seductive pleasures, he will be prepared to peer through the false and dazzling covering of these claws, and to discern the dangers lurking beyond and hidden. When young companions picture to him, in attractive words, the delights of the immoral pleasures of the world, he will be much less apt to yield to their tempting influence if he has been forewarned by the kind words of a loving father. But remember one thing, parents: if you desire your children to lead correct lives, you must set the example. If they see the father or mother living a life of immorality or incorrectness, their moral sense will be naturally blunted; they will accept this as the correct mode of life, since children, when they commence to reason and observe, instinctively look up to their parents as the most perfect type of life, and that from which they are to model. When, growing older, they see and realize, by contact with purer lives, the faults in you, they will regard you as inferior beings, and your authority over

them and their respect for you will rapidly diminish. While, at the same time, they will, unconsciously to themselves, view sinful pleasures with a certain leniency, born of bad example, that will be altogether incompatible with a true moral existence. You cannot expect any independent human being to obey you, when you order the denial of a seeming pleasure, in which you indulge yourself the while. It will be useless to preach to your son about the evils of intemperance, if he sees you daily consuming a certain quantity of spirits; or to tell him that it is wrong to use tobacco, when every evening he sees you deliberately light and enjoy an after supper cigar. When very young, he will disobey and do what he sees you do; when he grows older, he will regard these prohibitions as tyranny and will rebel. But if you are always careful to do yourself that which you tell him to do, he will be very apt to think you are right and will obey, because he notices that you, who are older and have more wisdom, do the same things. It is folly to talk about the father drinking in moderation and teaching his son to do the same; the law of moderation is almost an unknown quantity to the majority of young persons; with the impulsive temperament predominating at this period of life, whatever they do they do ardently and thoroughly; if good, they are very good; if bad, they are awfully bad; they know no half-way business; they lack the maturity to be guided by judgment in matters born of the human passions, and are controlled solely by impulse. Therefore, if the father *will* enjoy an occasional drink while his son is growing up, let him do so privately; do not let the boy see you; but if he should

ever find out that while preaching against it you are at the same time drinking on the *sly*, the additional bad seeds of *deceit* will be sown, and before you realize it, your son will be drinking *privately and hiding it from you*; tit for tat, you know; you must not be surprised to see your children doing anything that you yourself do; they are like monkeys in some respects; they are very imitative and very prone to do what they see others older than themselves doing.

But, now, I am going to advise something that may seem antagonistic to the views already expressed, but in reality it is not. When the young man reaches the age of sixteen or seventeen, if he seems inclined to be a little gay and wayward, be very careful how you handle him, or you may ruin him for life. Under these circumstances, the majority of parents assume the course of harshness and severity, which cannot be too much condemned. They command and demand obedience, which they do not receive. Their crossness makes the children cross, and they get at loggerheads. Some fathers whom I know will sternly say to a son of eighteen or twenty, "if you are not home this evening by ten o'clock the door will be locked." The young man may be with some friends, and forgetting the time, suddenly note that his hour has arrived; hurrying home, he finds the door of his own home locked against him. He must sleep some place; he cannot wander the streets all night; so, returning to his companions, with his mind full of anger against this unnatural father, he is prepared to become reckless, to drink deeply, and in an intoxicated condition, irresponsible, and knowing and caring not what he does, to

pass the night in the most riotous and demoralizing debauchery.

On a subsequent night, when he notes that his hour has unexpectedly come upon him, he will think that there is no use in going home, since he will surely be locked out; when, with some uneasy feelings of a reproachful conscience, tempered by parental harshness, he will dip into the bowl of excess, and pass another ruinous night. By degrees, this oft repeated experience will wean him from the beneficent control of home influence, and while maintaining an exterior of respectability, he will become a domestic outcast. He will hate this father who has been so harsh, he will have no taste for home, he will much prefer his boon companions, ever ready to receive him, cheerful, wild, gay dogs as they are. Forbidden pleasures will become tasteful to him, since home pleasures are denied him. From bad to worse, on he will go, until he winds up in a physical wreck and a premature grave, or becomes a social outcast, a drunkard, a sot, a specimen unworthy the name of man. And all through mistaken judgment on the part of the father.

This is not a fancy picture; I have known many such cases. I could, to-day, point out well educated young men whom I occasionally meet as conductors on street cars, whom I knew as young boys. Their families were intelligent and well off pecuniarily, and are still. The fathers' harshness and strict rules drove these boys through the various stages of the life I have described, until to-day they are really *good-for-nothings*. They are thieves, drunkards, liars, blasphemers, infidels; in a word, they are brutes, and they owe all their

degradation to their fathers. In some cases these parents love their children dearly, and are terribly pained to see them *going to the dogs*; but they lack judgment; they pursue the wrong course, in the first instance, to reclaim the boy, when he has barely stepped out of the path of rectitude, and before he has advanced far on the highway of perdition.

I once knew a prominent, intelligent and rich gentleman, who pursued the ideal course under these circumstances: When his boy showed the first symptoms of being *fast*, he commenced to reason kindly with him, and finding this of no avail, shipped him off to Europe in a sailing vessel, reasoning thus: "The boy has a stock of wild oats, and will sow them in spite of me. If I oppose him, I will make him worse. When his seeds are planted, they will, if their growth be not interfered with by parental authority, develop rapidly, and he will reap a crop of wisdom. In America, fast young men are usually loafers and blackguards; they drink *whisky*, become wild and almost crazy under the influence of excessive use of it, and injure their health and reputation. In Europe, and particularly on the Continent, nearly all young men pass through a gay period, but they do so comparatively respectably; they never get *beastly drunk*; they consume more wine than whisky; his surroundings will there be of a more refined and gentlemanly character. The soil in which he plants his wild seeds is better; it is richer, and the crop will grow with much less labor and much more rapidly than if planted in weedy soil that may choke and hinder it, and delay the ultimate fruits of wisdom." Within two years this young boy returned, a *man*; he

realized his errors, and setting to work with a will, became a young man of whom his father is and ever will be very proud.

I have given you the two extremes. What you want is the happy medium. There are very few parents who would or could do what the last father did, but there are very many who follow in the footsteps of the first.

To observe this medium you must, broadly, allow your son a "*free foot*;" if you do not allow it, he will *take* it; so, you had better make a virtue of necessity. At the same time, you ought to talk to him whenever an opportunity offers. Do not, when you see him about going out in the evening, call him into your study and read him a long lecture on the iniquity of his ways, and argue that he ought to do differently. His mind is occupied with some engagement he has made with young men, and the prospective pleasure in store for him, and becoming fidgety and uneasy as he sees the minute hand on the mantel clock go round, he hears not what you are saying, while, when you are through, and he is able to slip away, he mentally votes you an antiquated bore and nuisance, and tells his friends that he has just had a lecture from the *Governor*, at which they all laugh. So much for your untimely interference. If you repeat this unnecessary dose very often, the young man will exercise his ingenuity to evade you, since he knows what to expect. Therefore, in order to enforce your advice and to cause it to make an impression, you must, first of all, *set a good example*; this is a "*sine qua non*." Then, when you happen accidentally to be alone with your son, or when you

can make it *seem* to him that this being alone together is accidental, and he evinces no impatience or desire to go out, you can commence a conversation about worldly affairs, talking as one friend would to another. Treat this boy as you would your brother, and let him feel that you are doing so. Be careful and guarded, but at the same time be very plain. Bring the conversation gradually from general worldly topics down to the subject of how much evil and what unfortunate after results spring from youthful indiscretion. Remind your boy about so and so, who led a fast life, and point out its disastrous results. Select some case that he is familiar with, but do not let him think that you imagine for one moment that he is pursuing the same course. Without saying so, in so many words, talk as if you took it for granted that he would consider it beneath him to do the very things that you know he has been guilty of. If you do not tell him to the contrary, he will imagine that you are ignorant of his evil doings, and will never think that your remarks are intended for him. You can then direct the conversation toward the history of some of the great and good men of the day; you can, for instance, tell him something about Lincoln, or Garfield, and interest him in reading the history of their lives; when you perceive that he is tiring of this conversation, stop it and let him do as he pleases. At some future time take it up again, but never let him suspect your purpose.

A great point in the education of boys into young men, and to keep them from evil ways, is to make home attractive. Young persons love young company and gayety, and if they do not find it at home, they will

seek for it elsewhere. Have your house well lighted at night, and encourage your boys and girls, in every possible way, to spend their spare time either in your own house, with companions of their age, or in the house of some one who has brought up his or her children in the manner I have indicated.

Do not forbid the theatre ; if you do, your children will go all the same, and will lie to you about it ; so that they will, by your action, be made not only disobedient, but also deceitful liars.

Rather encourage them to go to these places of amusement with *you*. Make up parties of young persons to visit the theatre together, under your care ; but do not let the young folks imagine that you are going because you are afraid to trust them alone, but because you will enjoy it as much as they will. They will thus look on you as one of themselves, will consider you young and *full of fun*, like they are themselves, while at the same time they will much more readily receive and have ineffaceably impressed on their minds the ideas and actions which they observe and note in you, who, though they know to be older and wiser than themselves, yet they see enjoying the same pleasures that they do. They will imitate you, since they will consider it the right thing to do ; while if they went alone, they would have no one to whom to look up, and would be very apt to do whatever their immature and undeveloped instincts might dictate. This advice may seem like encouraging too much freedom and liberty. But it will not. Personal traits, like personal appearances, are hereditary. If a child inherits *goodness* from *good* parents, it may go wrong for a while,

but it will ultimately turn into the right road and come out all right. If, from the time of birth, you will carefully train and care for your children as I have indicated, you can rest assured that, if they have inherited good morality from morally healthy parentage, when they reach the age of young manhood, if they evince a tendency to be wild and gay, and if you follow my advice, they will soon sow their wild oats and settle down into good men. While, if you endeavor to restrain them by power of *enforced* parental authority, you will only make them worse. So consider and take this advice; let your *independent* children have their own way to a certain or even to a great extent. Remember that you must handle vegetable life very carefully, else you will ruin it, and realize also that the same is true of human animal life.

Do not forget that you can always accomplish far more by moral suasion than by brute force. Slaves can be driven, but remember that your children are *not* slaves and will not be forced. Be gentle, considerate, kind and politic. Set a good example, and by sensible and timely advice endeavor to induce your children to follow this example. By this means, and by no other, can you expect to produce noble men and women, human beings who will, throughout life, love and respect those who have brought them into the world, and will prove an honor and pleasure, in after life, to their parents.

We have thus briefly studied the physical and intellectual education of the human being, from the time it first becomes a thing of life, through the various stages, until we have it now a fully developed and thor-

oughly independent man or woman. It will be well, therefore, in continuance of our purpose, to go on and describe, in the succeeding chapters, how this human being ought to live, in order that it may enjoy to the utmost the pleasures of this life, and may, having reached old age, gradually and peacefully pass away, after having performed every possible duty and enjoyed every possible pleasure of which it is capable.

CHAPTER V.

OUR HOUSES AND GROUNDS ; HOW TO BUILD AND ARRANGE THEM ; DRAINAGE.

Houses are nuisances and are prejudicial to health. Let us take this for a starting point. The health of man would be better and his life longer if houses were unknown.

When God created the first man and woman, he did not erect a magnificent house and place them in it. On the contrary, he caused them to exist in open country. No one would doubt for a moment that he could have furnished them a house to live in, had he cared to do so ; but he did not deem it wise. From this we draw a lesson that subsequent experience has proven to be correct. We find the greatest vigor and the largest number of instances of longevity among wandering tribes, who know not the meaning of the word *house*. For two reasons is this so. First: living as they do, in the open air, they cannot possibly suffer from the ill effects of want of ventilation, while, moving from place to place, they escape the injurious results of defective drainage, since they do not remain long enough in one locality to allow of the development and action of these poisonous influences ; for, as we shall see further on, time is requisite in order that defective drainage poisons shall be generated. Secondly, from the hour of birth, these wandering children are subjected to the influence of all kinds of weather, so that

the process of hardening is successfully but almost imperceptibly carried out, whereby the child is rendered vigorous and insusceptible to the effects of slight atmospheric changes, as is the child of civilization. The society and mode of life bred of the gathering together of men into communities and cities is calculated to develop the intellectual side of mankind, while the lives led by the wild Indians of our plains, by the natives of South Africa, and by the wandering tribes of gypsies, are much more potent to develop the physical.

But, since we desire an equal development of both, in order that we may have the most perfect man, therefore does civilization and its accompaniments become an important factor in the accomplishment of this result.

Since we cannot all live in the woods and on the plains, and since houses are necessary to protect us from the inclemencies of the weather, because we have been so reared that exposure would be injurious, and to enable us to live our secret lives unknown and unexposed to the gaze and criticism of our neighbors; since, in a word, houses must be, it becomes our duty to so arrange them that we will derive from this artificial life the greatest amount of good and the least proportion of harm. I do not intend to go minutely into the discussion of the fine points involved in house building and drainage, for two reasons: In the first place, the majority of my readers would not understand me if I did; what would they know about these intricate questions that really constitute a science, to which a man must devote many years of study ere he becomes proficient, and which it would be impossible for any

one to thoroughly learn from these few pages. Secondly, because I do not consider it necessary. As I have already said, very strict rules about anything, in connection with any walk of life, are apt to be disregarded, on account of their very stringency; thus they become worse than useless, because a person feeling that he cannot comprehend them, is very apt to throw down the book in disgust and do as he chooses. Again, I consider these very strict rules unnecessary, since by living reasonably well a person can enjoy very good health, and can reach a reasonable degree of longevity. The majority of books written on houses and drainage are not practical, because their directions can only be carried out by a rich man, who can afford to build his own house. Realizing these shortcomings in most of the works on hygiene, it has been my purpose to formulate a mode of life that all (rich and poor alike) can follow, without expense and without inconvenience to themselves.

The very large majority of people in this world are compelled, by circumstances, to live in rented houses. The few who are so fortunate as to possess the means wherewith to locate and build their own homes can secure the services of good architects and of scientists in hygiene, who can so direct them that a faultlessly healthy house will be erected.

But for the majority, who cannot do so, this chapter has been written.

When you are about to rent a house, there are three prime points to be taken into consideration. In discussing them, I will first suppose you are intending to reside in a city.

They are, 1st, location ; 2d, arrangement, or architecture of the house ; and 3d, drainage.

1. *Location*.—The location is a very important point. If you are living in a city that is very hilly, as, for instance, Baltimore, never select the bottom of a descent, for reasons that you will learn when we discuss drainage. Be very careful to note surroundings. If there happens to be any kind of a business establishment in which organic remains are used, that is, where they utilize anything that has had life, do not locate there, because the decomposition of these organic bodies may give rise to poisonous gases and particles, which, carried into your house by the wind, will produce malarial poisoning, or even worse disease.

Shun the vicinity of chemical works, because, in the manufacture of many drugs and chemicals, poisonous and irritating gases are formed, which, passing out through the chimney, mingle with the atmosphere you breathe, and may be the cause of many irritating diseases. Do not locate near large factories, especially such as use soft coal. For, not only will the constant noise and buzz of the machinery have an injurious effect on your nervous system, but also will many unburnt particles of this coal pass out of the chimney, and inhaled into your lungs, produce serious disease, maybe, even consumption.

Avoid very narrow streets, as you would the plague, for into them the sun can never thoroughly shine, and its presence is as necessary to healthy life as is food and water. I have told you a few of the things to be avoided ; I will now describe a typically healthy city location, and from it you can intelligently draw your

conclusions in selecting a home. The nearer a location corresponds to this ideal one the healthier will it be, and vice versa.

Suppose a well paved street, fifty feet wide, with houses on either side, and gardens between them. Let this street run north and south. Each house should be open back; it ought to have a good-sized back yard. See what you have. The morning sun will shine into the back and the afternoon sun into the front of the houses on the east side of this street, while those on the west side will receive it on the front in the morning and the rear in the afternoon. Thus, then, will every portion of such a house receive, some time during the day, the healthful influence of the sun's rays.

As an additional proof, if any is needed, to what I have already adduced, to show that fashion and health are in many cases antagonistic, I will cite the residences of the fashionable people of our city.

The majority of them are located on the south side of a street running east and west. The street is very narrow, and the sun, from one year's end to another, never shines on the fronts of these houses. It is true, they are very open back, and there receive the morning sun; but the front part, that in which the family lives, never receives its rays.

Too much stress cannot be laid on this point. You cannot have a location that is *too* sunny. During the middle of a hot summer day you can artificially shield yourself from the sun, but it will be all the time drying the walls of your house; while it will be impossible to avoid having a damp house if the sun does not shine

freely upon it, I care not how many furnace fires you may have. Therefore, in selecting a location, note these points. That there is plenty of sun. That the street is broad and clean. That there is no possibility of the results of organic decomposition or of injurious chemical or mineral elements being waisted into the house; and if you find all these conditions correct, you can rent the house with safety, provided the following points are satisfactory.

2. *Arrangement, or Architecture of the House.*—You must look for a house with amply large rooms, and so arranged that ventilation will be easily obtainable. There can be no doubt that a low square house is the healthiest; for in such a house, unless it is bounded on either side by other houses, windows and doors are to be found on every side. They are necessary for ventilation; you will soon learn that ventilation means the entrance of pure and the exit of foul air. So if you have windows and doors in every room, opposite to each other, it will be a very easy thing to secure good ventilation.

Currents of air are like currents of all other kinds. You know that nature abhors a vacuum, and if she can help it, will not allow such a thing to exist. So, then, if you open a window in a room of a certain temperature, and open a door leading into another room of a higher temperature, the air from the first room will be drawn into the second, while fresh air from without will enter through the window, to take its place. These same currents are continually at work in the outside atmosphere; air cannot keep still, it must be always moving; therefore, if you only give it a chance, by having doors

and windows opposite each other, it will ventilate your house. But suppose a room has only one window in a front wall, and one door in a wall running at right angles to the front wall; see what occurs. When the pure air enters through the window, it keeps on straight ahead until it strikes the blank wall at the other end of the room. It then rebounds, and after a while a portion of it will manage to squirm around and get out of the side door; but in its headlong course, it will carry many of the impure particles in the room up against this wall, and will deposit them thereon, and while lazily wandering around, before it finds the out-of-the-way door, these heavy particles will gradually settle down lower and lower, on account of their own weight, until they finally settle on to the floor, from which they will be again stirred up into the atmosphere by walking about, and breathed into the body. These impurities do not become *dissolved*, but are only *mixed* in the atmosphere. You all know that, if allowed to stand for a while, the solid particles of a *mixture* will separate from the liquid and sink to the bottom of the bottle, leaving the pure fluid above. So it is with this air. If, when it rushes in a window, and seizes hold of the impurities of a room, to make a mixture of air and impure particles, it can get out again quickly, it will carry these particles with it; but if it finds its direct course stopped, and has to hunt around for a means of exit, time will be allowed for these particles to settle.

This, in a nutshell, is the secret about ventilation, concerning which so much has been written. If you will allow air from without to freely enter and to easily

find a way out again, it will carry with it those impurities that are prejudicial to health.

If it could be so arranged, it would be well to have the kitchen on the top floor of the house. Thus all bad or unpleasant smells would ascend and be carried away, and could never pollute the dwelling portion of the house.

Remember what I will say about the quantity of air requisite for each individual, in the chapter on ventilation, and when you look at a house, measure whether the different rooms are large enough to contain the required amount.

Examine carefully into the condition of the cellar. Be sure it is not damp, and never occupy a house unless the cellar floor is cemented. I do not care how dry it may seem, nor how dry the landlord or his agent may tell you it is, all cellars must be damp. All earth contains water. It is necessary, it is universal. When bricks are first made from clay, they contain water. The sun and artificial heat bake them, it removes this water and makes them solid. The sun can never get at cellars, therefore the earthen floor must contain water. This of itself would not be injurious; but this earth also contains organic particles. When, then, in winter, the cellar is made warm by the heat from the furnace, or even as a result of the natural heat of the soil itself, we have the three elements necessary for the production of organic poisons, viz., organic matter, heat and *moisture*. Organic decomposition ensues and malaria results.

But, although these changes may take place, yet, if the cellar floor is cemented, they are rendered innocu-

ous, because they are imprisoned ; they cannot rise up and be carried into the upper portions of the house.

You are all familiar with the nasty, damp, foul odors that sometimes arise from cellars. If the floor is well cemented and the resulting smooth surface frequently washed, this will be unknown.

The following mixture may be used for this cementing purpose, and it will render the cellar waterproof, viz. : coal tar and quick lime.

These few words will convey to you all the important and practical points that it is possible for a man to take into consideration when selecting a house already built, and will enable me to pass on to the discussion of

3. *Drainage*.—Drainage is one of the most important considerations, if not the prime one, in selecting a house. Broadly and roughly speaking, it means the removal from the vicinity of man of all the matter that may in various ways be cast off from his body. A few more words about refuse matter and drainage will now be appropriate, in order that you may properly comprehend the subject.

The bowels of man are the human drain pipes. They receive and carry away from the body the tissue that has performed its duty; that is dead, worthless, and unfit to remain, the continued presence of which in the body would poison it. So, it might be said that the system of drainage commences inside of the human body, and ought to terminate far from the haunts of civilization, to be perfect; but to be practicable, I will say that this refuse matter from the body ought to be carried continuously along, without hindrance or stop, until it is deposited at a safe distance from the human individual.

To clearly illustrate the purposes of drainage, some space will be necessary, and I might as well discuss it here, since the mechanism, the main points of drainage, as well as the benefits to be derived from it, and the evil results of want of it, are the same in both city and country, although the measures resorted to to secure it differ, and will be discussed separately.

In order that you may have a true conception of the purposes of drainage, it will be necessary to go back some distance, and commence at the very beginning. Food is taken into the system, because the body requires nourishment. In the stomach and upper portion of the bowels it is dissolved, digested and converted into nourishment suitable for the body. Absorbed into the blood, it is carried throughout the body, to nourish every portion thereof. In this necessity for food or nourishment, in this process of renewal, is to be found one of the differences between animal life and inorganic inactivity. If nourishment were refused to the body, it would die, you all know; but why? When the body is fully formed, why can it not remain so, without any more nourishment? Because, as I have told you, every act of life entails, as the result of its performance, the destruction, or, to speak more literally (since matter is indestructible) the alteration of the particles of tissue concerned in its performance. So, then, when these particles of tissue are called upon to execute any act of life, it matters not whether it be a contraction of a muscle in exercise, an effort of the brain in thought, or an involuntary contraction of the heart, they become so altered by the performance of this act that they are no longer suitable to form a part of the body.

When coal is thrown into the furnace of an engine, it becomes a part of the machine that is to generate power, just as much so as bread and meat become a portion of the human machine. The coal is as necessary to the generation of steam force as food is to the production of vital force. But when the coal has done its duty, has yielded up its imprisoned force, it becomes useless. A portion of its latent power has been converted into a new force, which, with the power derived from water, is represented by steam and its manifestations. If the dead coal, or ashes, are allowed to remain in the furnace, they will clog it up and interfere with its future performances. So it is with human coal, or food. The various articles of diet taken into the body undergo a chemical change, just as the coal in the engine does, and as a result of this chemical change they are made suitable to furnish nourishment for the body. They become for a short time intimate and integral portions of it; but when, in the course of life, it becomes necessary for any part to use its resident vitality, and such occasions occur every moment of our existence, these elements are required to furnish the requisite force, and in doing so part with their vitality. They become human ashes. But they are not harmless and innocuous as coal ashes are. They are not simply the products of chemical disorganization of a mineral substance, but are, in addition, the dead elements of organic life. They are no longer fit to form an integral portion of the animal body, and, according to nature's beautiful laws, will not again be so fit until they serve a probation, a purification, as it were, by a passage through and residence in vegetable life.

So, then, these useless particles must be removed. Here, in the most intimate recesses of the system, then, commences the system of drainage. Certain vessels pick up these dead and useless elements and carry them along, from smaller to larger, until finally, they are brought to and removed from the body by the four great scavengers, the bowels, kidneys, skin and lungs.

All four of these organs (for the skin must be considered an organ, when viewed from its eliminatory standpoint) are intended in a prime degree to remove from the body its waste ; to act as drains. But when they have done their duty, they have only removed these elements from the body, and they leave them in a condition favorable for decomposition, a process that all organic bodies must undergo.

When this decomposition takes place these elements become doubly poisonous, and if then taken back into the system, either in their solid form or as gases, they are capable of producing most serious disease.

So, then, after the natural drainage has removed these poisons from the body, it becomes the necessity of what we commonly know as *drainage*, and which might be called artificial, to carry them far away, so that they cannot be again taken into the system.

Thus, then, you can understand that everything that comes from the body, having once had life in your body, is unfit to remain in your vicinity and must be removed.

Drainage means a system of pipes so constructed as to carry off all this waste. In cities, you all know that these pipes run from houses into sewers in the streets, and these sewers terminate in rivers. This is

the only practicable way known to us at present of disposing of sewerage in large cities, where the quantity is so enormous. The end to be accomplished, and that nature does eventually succeed in doing, is to disinfect this poisonous material, or in other words to so again alter it that its deleterious properties are destroyed, it is rendered innocent.

The most effectual disinfectant we know of is earth. Were all the refuse of a city to be collected in a pit, and at certain intervals a quantity of earth were thrown into it, we would have no poisonous or bad air generated from it. When an army goes into camp, they dig what are called *sinks*; ditches, some sixteen feet long, six feet deep, and eighteen inches wide. The earth removed in digging this trench is piled up alongside of it; into this pit all refuse is thrown, and it becomes the duty of the police department of the camp to thoroughly cover this excrement with earth, at stated intervals. It thus becomes mixed with and forms an integral portion of the soil, as nature intends it to do, and as it has once formed a portion of man. After a while it furnishes nourishment to and it becomes a part of the grass; the cow eats it and it becomes a part of this animal; the man eats the cow and it again becomes a portion of the human being. This is the cycle of all material life. From one animal, through vegetable life, back again to animal existence; so it has been from the beginning of time and so it will ever continue to be.

When it is possible to so dispose of animal excreta, to immediately return it to the soil, then have we the most perfect means of drainage.

But in cities this is obviously impossible. Hence, must we resort to pipes.

These outside iron pipes are intended to perform precisely the same duty that the inside human pipes do. To carry away this refuse matter.

The matter from the bowels, the urine, the water in which the surface of the body is washed, all contain this dead tissue. So does the water in which the table dishes are washed; as well as that in which the clothing soiled by the dead tissues from the body is renovated.

This must all be removed from the vicinity of man, for a time, until purified by chemical changes, else it will poison him and produce disease. You now understand the purposes of drainage. How is it carried out? Every modern house has its water-closets and sinks. From these run pipes, carrying the water into the main drain, running under the cellar floor, and emptying into the street drain, which in turn empties into the sewer, and these into a river.

Very good in theory, but not so good in practice. These sewers in the street are very large. It takes a great deal of liquid to fill them. If they happen not to be full the circulation through them is sluggish. So that some of this dead organic matter remains in them and there decomposes. Then what happens. The result of this decomposition is to form injurious gases, which, on account of the natural tendency of gases to ascend, will find their way back through the pipes they have once passed through as solids or liquids, and unless prevented, will emerge at the water-closet or wash-basin, to mingle with and poison the atmosphere of

the house. These gases you will recognize as the much talked of "*Sewer Gas*," which is so potent a factor in the production of typhoid fever and other diseased conditions.

Thus, then, you now understand the purposes and mechanism of drainage, and you know what *sewer gas* means. You can realize, strange as it may seem, that these very poisonous gases are generated by changes taking place in that very tissue that has at one time formed an integral portion of your body. When you realize how dangerous these superannuated and dead particles may become, you will naturally be more solicitous to quickly remove them from your neighborhood.

To facilitate the removal of this dead tissue, and to prevent the return of these gases, has been the design of scientific plumbing.

A few words will explain how this is accomplished.

A liberal supply of water (and there ought never to be a closet in a house unless there is a plentiful supply) will wash this excrement away and carry it into the sewers. But to prevent the return of the gases, something else is necessary, and for this purpose we have *traps*. A trap is a piece of pipe made something like the letter S. When the water comes from the upper portion, passes through the basin of the water-closet and going through this curved pipe, carries the excrement with it, a portion of the water remains in and fills up this curve. Hence, when the gases come back through the pipe and get to this trap, their further progress is arrested by this body of water, standing as a sentry between the lower pipes and the atmosphere of the room. But they do not

always act as they are supposed to do. If the closet is not frequently used, after a while this water will absorb some of these gases, and allowing them thus to pass through, will give them off from the upper end, when they are free to escape into the atmosphere of the house.

In endeavoring to obviate this possible defect of the water-trap, many patent devices have been invented, but none have been found perfect, since these gases are very insinuating, and when they exist in any large quantity will manage to find their way through some unsuspected crack, crevice or opening.

The best means to keep them out of the house, taken in connection with a well-made, ordinary water-trap, is the ventilating pipe. To insure safety this pipe must be used for this one purpose and for it alone.

A pipe of iron or terra cotta, preferably the latter, should commence at some point in the main drain, running from the house to the street main, and ought to be carried directly upward and terminate in an open end above the roof of the house. The opening of this ventilating pipe where it connects with the drain should be large, and its junction ought not to be at a right angle, but rather oblique.

Here, you can see that the poisonous gases coming back from the sewer will turn up the ventilating pipe, since they are anxious to ascend, and if they do not avail themselves of this opening, they see a long stretch of level pipe before them, which is distasteful, since they are ambitious and desire to go up.

Some persons use the rain-pipe for ventilating sewers; this is very wrong, because this pipe usually

commences at a gutter on the roof, just below the attic windows, so that this poisonous gas will be eliminated just where it can enter these windows and pollute the air of the house. Again, in rainy weather, the water running down these pipes will prevent the sewer gas from getting up, and will force it to come up to the traps.

This pipe ought to be carried alongside but outside of the chimney. The heat of the chimney will thus warm the air in the pipe and cause an upward current. But it ought not to be inside, because if it happens to leak, its poisonous contents will escape into the chimney, and may, under certain conditions, be drawn down, and so into the house.

Just here I will enumerate a fundamental rule about plumbing, for any of my readers who may ever build a house. You ought never to have any pipe, whether it be water, gas or drain, hidden from sight and inaccessible. It would not, of course, be pleasant to have all your pipes sticking out where you could see them all the time; but you ought to lay them in boxes, with a door, so that they could be inspected at any time. Then, when you have any cause to suspect that your drainage is wrong, a thorough examination of all the pipes can and ought to be made. Very often the terra cotta drain running under the cellar floor will break and allow its poisonous contents to ooze out, saturating the cellar floor with poison that will rise into the house. If this drain were above ground such a break would be at once detected.

If, then, you have a trap well constructed, and a separate ventilating pipe, you will be reasonably secure

from the dangers of sewer gas. But I would advise you not to rent a house without this safety valve or ventilating pipe.

Prevention is better than cure, you all know. Therefore would it be much better to utilize such measures as would surely remove this decomposing material from your presence and allow the generation of the poisonous gases to take place where they would be harmless. Such a plan I suggested in my work on "*Malaria*," which was, in substance, as follows. The erection of large reservoirs at suitable intervals, the establishment of a liberal number of fire plugs. Every morning early, for two hours, say from two until four, turn on these plugs and let the water flow from them continuously. A force of men with brooms, to sweep the streets. This would have the result of furnishing absolutely clean streets, while this great bulk of water flowing into the sewers would so fill them that all their contents would be hurried on to the river, and sewer gas could not be, because the conditions necessary for its development would not be present. Therefore it could not poison the air of houses, since it would not exist near them.

But until these Utopian days come, *sewer* gas will exist, and we must endeavor to prevent its entrance into our houses. Therefore, you must pay particular attention to the two points I have indicated, viz.: good traps and ventilation of drains. Traps are very good as far as they go, and it would be well, in addition to having one on each water closet and basin pipe, to also have a large one on the main drain, just before it reaches the point at which the ventilating pipe starts.

Many good works have been written on drainage, notably that by Colonel Waring, on "Sanitary Drainage of Houses and Towns," and to such I would refer those who are about building and desire the most recent knowledge on sanitary drainage. This book could not tell everything, but still it does give the important points. Having now disposed of the really important questions concerning drainage in cities, it will be in order to discuss the same subject in its country relations. With a little intelligent knowledge on the subject, the resident of the country has it much more under his control to remove these deleterious particles, and to prevent the return of sewer gas, than has the occupant of a city house, for the following obvious reasons: The accumulations of refuse organic matter ready to undergo decomposition are very much greater in a given space in the city than they would be in the same area in the country. The waste from a very large number of houses will enter into one sewer, when the probability of generation of sewer gas in quantity becomes very great.

You cannot look into the sewer and see whether it is clean or not. But, into all the arrangements of your own individual house you can peer at all times, and can plainly see whether they are all right or not.

In the first place, you must learn how to select a healthy location when going to live in the country. In a few words I can tell you how to do so. Leaving out of consideration all other points, and hunting merely for a *healthy* location, one that will not be malarious from dampness or bad drainage, the desideratum will be *high ground*. Not necessarily positively, but rela-

tively high. It must be higher than the surrounding country, for this simple reason: If higher, naturally everything will drain away from it, while, if lower, the surrounding country will drain into it.

A basin-like location will act as a cess-pool for the neighboring country, and into it will drain all your neighbor's refuse matter. Such low land will answer very well for pasturage, but is altogether unfit for human habitation.

Having now selected a high point upon which to locate your house, the same indications for drainage must be observed as are described for the city. You will require pipes running from every opening that receives refuse matter, and well trapped, to terminate in the main drain in the cellar. But in the country you have no sewers into which this pipe can empty, so that you are compelled to provide some means of emptying it.

By all odds, the very best country drainage that can be conceived would be the following, and it would for many reasons constitute an ideal location: If your house stands on a bluff or eminence, with a sharp descent to a swift flowing stream, three or four hundred yards away, then indeed can you have perfect drainage. By carrying your main down the hill and terminating it in this stream, below the surface, all refuse matter will rapidly flow down and into the water, when it will be carried away. If, however, you have neighbors further down, who derive their water supply from this same stream, then such drainage will be impracticable, since it would poison the water.

Again, even if this objection does not exist, you must

be very careful to note whether this stream dries up in summer. If it does, your refuse matter will be deposited on the bottom, exposed to the fierce rays of the sun, when it will decompose, and the resulting poisonous gases be lifted up and carried toward your house whenever the wind happens to be blowing in that direction. If there be no objection on the score of neighbors, and if there is sure to be plenty of water, even in the driest summer, then drain into this stream. The water flowing continually past the open end of the pipe will create a current that will tend to help the water from above to carry down the refuse. Never have a water-closet in a house, unless you are sure of a constant and plentiful supply of water. No matter how faultlessly your drainage may be arranged, if you cannot thoroughly wash down the pipes with water, sewer gas will generate in them and find its way back. Also have a separate pipe for your kitchen refuse (from the sink) from that draining the closets and basins. Kitchen refuse, dish-water, and the like, is greasy; it contains particles of fat. I have known cases, where one pipe was made to serve both purposes, that the closet drainage became deranged, and upon investigation, it was found that these particles of fat had become solidified into a jelly-like mass in the pipe, and thus interfered with the free passage of the refuse from the closets.

If you have separate pipes, and this does occur in the kitchen drain, it will not be serious. Just here, a hint about the waste and overflow pipes from basins and bath tubs. The opening for the overflow pipe, you know, is high up on one end of the tub, and its

purpose is to allow the water to pass away, and not overflow the tub, if you have turned on the spigots and then, going away, forget them. If a good plumber has done the work all will be well, but some ignorant men will allow these overflow pipes to terminate in the water-closet drain at a point *below* the trap, when, as you can understand, gases that cannot pass the trap will ascend these pipes and escape into the room through the overflow openings.

Again, it is very important that, if you use tank water for drinking and cooking purposes, you should have two tanks, one for drinking and one for the washing out of the water closet.

You can see that by having only one tank any sewer gas that may find its way past the trap and up into the basin of the water-closet will pass up the supply-pipe, into the tank, and mixing with the water there, will pass down the other pipe and pollute the water drawn from the spigots at the sink for drinking or any other purpose. But if you have a separate tank for the water-closet, with a tight-fitting lid, this cannot happen. It would even be better, if possible, to draw the water for the closet from a separate well, because it is possible for the sewer gas to contaminate the water in the well, and so to poison the drinking water, even though separate tanks may be used. This is not to be apprehended as a serious danger, since, if you have good traps and resort to the ventilating-pipe, very little if any sewer gas will be able to find its way back to the closet. Still, where one can afford it, and desires to use every precaution, separate wells, some distance from each other, will form additional safeguards. Do not allow

the main drain to run any nearer the well from which you get your drinking water than you can help. If you do, the pipe may break, when its contents will flow into the well and pollute the water.

If the overflow-pipe from the tank runs into the drain, you must use the same precautions as for the overflow from the bath-tub; though it would be better for this pipe to empty into the rain-water pipe outside.

As an additional protection against any sewer gas that may pass the trap entering the bath-room, and so becoming disseminated throughout the house, the following simple device will prove very good:—

If directly over the water-closet, on the wall, you have constantly, burning low, a lamp, and just above this commence the wide funnel-like opening of a tin pipe, which is then carried to and through the upper sash of the nearest window; see what occurs. The heat from this lamp constantly warms the air in its vicinity and creates an upward current. The foul gases that may arise from the closet are carried up by this current into and through the pipe, and are discharged out of doors.

You now have a very fair notion of the arrangement of drain pipes and the dangers and disease that may result if this dead organic tissue is not thoroughly removed from your vicinity.

I will now go on to the discussion of the final distribution of this refuse matter when your location does not permit of its being emptied into a swift flowing stream. This organic debris will make very good manure. By itself it is a little too rich, but when mixed and diluted it becomes very valuable in this connection.

Hence we are now reading of the sewage farms of Europe.

I had a neighbor once, in the country, who always had earlier, larger and better vegetables in his truck garden than any one in the vicinity. We all wondered at this, since his soil seemed no better than ours. Finally his secret leaked out, and we were surprised to find that he was in the habit of dipping out of his cess-pool and watering his vegetables with this semi-liquid manure. It was truly astonishing to see how they jumped into maturity.

From this we learn a lesson. Dig a well, some ten feet deep and about two or three hundred feet from your house, the further the better. Brick and cement the sides and bottom. Into this let your main drain empty. Let your stable manure accumulate alongside of this well. Sink a pump. Have a large pile of earth handy. Now, two or three times a week, let your man pump all the liquid out of this well into the manure heap, and over the top throw a light layer of earth. When the well becomes nearly full of solid matter, remove the covering (which ought to fit very tight), and bail or shovel out this solid excrement into the heap. Then throw over the whole mass a heavier layer of earth. This will accumulate a pile of manure that will delight the heart of the farmer, and, when spread over the ground, will most wonderfully enrich it. While, at the same time, you will be enabled to dispose of your refuse in a healthy way.

Surface drainage, so commonly resorted to in the country, is such a terrible abomination, that I can only wonder how any one can resort to it, no matter how

little knowledge of hygiene they may possess. I will tell you what it means, and I am very sure you will at once procure a longer pipe and dig a well.

To tell you, I will describe the surface drainage of a house with which I am very familiar, and which will serve as a sample of the majority of medium country houses. The pipes inside were all well arranged, as I have indicated, and when they converged into the main this left the house, and after running for about thirty or forty feet under ground, its open mouth discharged the contents right on the surface of the ground.

The theory here was, that the refuse, coming down in a semi-solid condition, would flow down the descent upon the side of which the pipe emptied, and in its downward course would gradually soak into the earth. But, in the practical fulfillment of this theory, there will be found several hitches.

In the first place, there is what chemists will call a "*point of saturation*." A time comes when the soil around the open mouth of this pipe becomes so saturated, so full of this refuse, that it will be unable to absorb any more; when some of the surplus will flow further down the hill, while the balance will remain on the surface around the pipe, and there undergo decomposition. Again, around this opening will be found weeds; now, naturally, some of the solid particles will become entangled in these weeds, and will be held there on the surface. The sun will beat down on them, they will decompose, and in the form of poisonous gases they will be wafted back into the house they have but just left as poisonous solids.

The question of drainage you will now sufficiently understand to enable you to intelligently remove from your presence what is, beyond all doubt, the most insidious and dangerous enemy of health and long life, *gases of decomposition*. In concluding this chapter, a few words on the arrangement of houses and grounds may assist any one having the intention of building.

Bricks are porous, and will allow air to pass through them; so also will brown stone; while granite, slate and marble are impervious. Therefore, realizing, as you now do, the necessity for all the air you can get, you will think it wise to build of bricks or brown stone. Wall papers are impervious to air and they will absorb dead organic matter in considerable amount. Therefore are they not to be commended. A house that is painted inside, or finished in natural woods, will be, not only much handsomer, but much healthier.

Although not relished by the male portion of the community, yet repeated house-cleanings are very necessary. You can understand, when you realize how much organic refuse accumulates, how necessary it is to remove it.

Large windows and large doors will help much to make a healthy house. You cannot have them too wide and too high. You remember what I said about tent life. The larger you make your openings, the nearer will your house approach a tent. It will also, even when the windows are closed, enable a plentiful supply of sun and light to enter. It has been said in some works on hygiene, that the water-closet ought to be located in an annex, separated from the house by a passage-way, ventilated by windows on either side.

While this would be an extra precaution, and would be the wisest plan, yet it is not comfortable, since what could be more pleasant than to have the comforts of bath and closet in a small room adjoining the sleeping apartment.

I believe (and would practice what I preach) that, if all the precautions laid down were faithfully carried out, and frequent examinations made, to see that nothing goes wrong, no injury to health would result from this proximity of the closet. To repeat, sewer gas has no business to exist near the house, and if you will use common sense, now that you know how it is generated, it will be a stranger. Remove the material from which it is made and it cannot be.

Of all rooms in the house, make your nursery large, bright and cheerful in every respect. Realizing how important surroundings will be to your young and growing children, make their surroundings of the pleasantest possible character.

For the benefit of the rich who desire to erect an ideal sanitary house, I will quote the following directions from an address entitled "Hygeia," by Dr. Benjamin Ward Richardson, of England. This idea will, of course, be opposed diametrically to the present plan of building, but, in his address, Dr. Richardson is describing an ideal city, such a city as would represent the most perfect type of healthy arrangement, while at the same time such a house is capable of being erected by any one desiring to do so: "Whatever disadvantages might spring, in other places, from a retention of water on a clay soil, is here met by the plan that is followed, of building every house on arches of solid brick work.

So, where in other towns there are areas, and kitchens, and servants' offices, there are here sub-ways, through which the air flows freely, and down the incline of which all currents of water are carried away." "It will be seen, from what has already been told, that in this our model city there are no underground cellars, kitchens or other caves, which, worse than those ancient British caves that Nottingham can still show the antiquarian as the once fastnesses of her savage children, are even now the loathsome residences of many millions of our domestic and industrial classes. There is not permitted to be one room under ground. The living part of every house begins on the level of the street. The houses are built of a brick that has the following sanitary advantages: It is glazed and quite impermeable to water, so that during wet seasons the walls of the houses are not saturated with tons of water, as is the case with so many of our present residences. The bricks are perforated transversely, and at the end of each there is a wedge opening, into which no mortar is inserted, and by which all the openings are allowed to communicate with each other. The walls are in this manner honeycombed, so that there is in them a constant body of common air, let in by side openings in the outer wall, which openings can be changed at pleasure, and, if required, can be heated from the fire grates of the house. The bricks intended for the inside wall of the house, those which form the walls of the rooms, are glazed in different colors, according to the taste of the owner, and are laid so neatly that the after adornment of the walls is considered unnecessary and, indeed, objectionable. By this means those most

unhealthy parts of household accommodation, layers of mouldy paste and size, layers of poisonous paper, or layers of absorbing color stuff or distemper, are entirely done away with. The walls of the room can be made clean at any time by the simple use of water, and the ceilings, which are turned in light arches of thinner brick, or tile, colored to match the wall, are open to the same cleansing process. The color selected for the inner brick work is gray, as a rule, that being most agreeable to the sense of sight; but various tastes prevail, and art so soon ministers to taste, that, in the houses of the wealthy, delightful patterns of work of Pompeian elegance are soon introduced.

"As with the bricks, so with the mortar and the wood employed in building, they are rendered, as far as possible, free from moisture. Sea sand, containing salt, and wood that has been saturated with sea water, two common commodities in badly built houses, find no place in our modern city.

"The most radical changes in the houses of our city are in the chimneys, the roofs, the kitchens, and the adjoining offices. The chimneys, arranged after the manner proposed by Mr. Spencer Wells, are all connected with central shafts, into which the smoke is drawn, and, after being passed through a gas furnace to destroy the free carbon, is discharged colorless into the open air. The city, therefore, at the expense of a small smoke rate, is free of raised chimneys and of the intolerable nuisance of smoke.

"The roofs of the houses are but slightly arched, and are, indeed, all but flat. They are covered either with asphalte, which experience out of our supposed city has

proved to last long and be easily repaired, or with flat tile. The roofs, barricaded round with iron palisades, tastefully painted, make excellent out-door grounds for every house. In some instances flowers are cultivated on them.

"The housewife must not be shocked when she hears that the kitchens of our model city, and all the kitchen offices, are immediately beneath these garden roofs; are, in fact, in the upper floor of the house, instead of the lower. In every point of view, sanitary and economical, this arrangement succeeds admirably. The kitchen is lighted to perfection, so that all uncleanness is at once detected. The smell which arises from cooking is never disseminated through the rooms of the house. In conveying the cooked food from the kitchen, in houses where there is no lift, the heavy weighted dishes have to be conveyed *down*, the emptied and lighter dishes *up stairs*. The hot water from the kitchen boiler is distributed easily, by conducting-pipes, into the lower rooms, so that in every room and bed-room hot and cold water can at all times be obtained for washing or cleansing purposes; and as on every floor there is a sink for receiving waste water, the carrying of heavy pails from floor to floor is not required. The scullery, which is by the side of the kitchen, is provided with a copper and all the appliances for laundry-work; and when the laundry-work is done at home the open place on the roof above makes an excellent drying ground.

"In the wall of the scullery is the upper opening to the dust-bin shaft. This shaft, open to the air from the roof, extends to the bin under the basement of the house. A sliding door in the wall opens into the shaft

to receive the dust, and this plan is carried out on every floor. The coal-bin is off the scullery, and is ventilated into the air through a separate shaft, which also passes through the roof."

"On the landing, in the second or middle stories of the three-storied houses, there is a bath-room, supplied with hot and cold water from the kitchen above. The floor of the kitchen and of all the upper stories is slightly raised in the centre, and is of smooth, gray tile; the floor of the bath-room is the same. In the living-rooms, where the floors are of wood, a true oak margin of floor extends two feet around each room. Over this no carpet is ever laid. It is kept bright and clean by the old-fashioned bees-wax and turpentine, and the air is made fresh and is ozonized by the process."

"Considering that a third part of the life of man is, or should be, spent in sleep, great care is taken with the bed-rooms; so that they shall be thoroughly lighted, roomy and ventilated." "To facilitate communication between the kitchen and the entrance-hall, so that articles of food, fuel and the like may be carried up, a shaft runs in the partition between two houses, and carries a basket-lift, in all houses that are above two stories high. Every heavy thing to and from the kitchen is thus carried up and down, from floor to floor, and from the top to the basement, and much unnecessary labor is thereby saved." "A flight of outer steps leads to the upper or kitchen floor."

"The warming and ventilation of the houses is carried out by a common and simple plan. The cheerfulness of the fireside is not sacrificed; there is still the

open grate in every room, but at the back of the fire-stove there is an air-box, or case, which, distinct from the chimney, communicates by an opening with the outer air, and by another opening with the room. When the fire in the room heats the iron receptacle, fresh air is brought in from without, and is diffused into the room at the upper part."

"As each house is complete within itself, in all its arrangements, those disfigurements called back premises are not required. There is a wide space, consequently, between the back fronts of all houses; which space is, in every instance, turned into a garden square, kept in neat order, ornamented with flowers and trees, and furnished with playgrounds for children, young and old.

"The houses being built on arched sub-ways, great convenience exists for conveying sewage from, and for conducting water and gas into, the different domiciles. All pipes are conveyed along the sub-ways, and enter each house from beneath. Thus the mains of the water-pipe and the mains of the gas are within instant control on the first floor of the building, and a leakage from either can be immediately prevented. The officers who supply the commodities of gas and water have admission to the sub-ways, and find it most easy and economical to keep all that is under their charge in perfect repair. The sewers of the houses run along the floors of the sub-ways, and are built in brick. They empty into three cross main sewers. They are trapped for each house, and as the water-supply is continuous, they are kept well flushed. In addition to the house-flushings there are special openings into the sewers, by which, at any time, under the direction of the sanitary

officer, an independent flushing can be carried out. The sewers are ventilated into tall shafts, from the mains, by means of a pneumatic engine.

"The water-closets in the houses are situated on the middle and basement floors. The continuous water-supply flushes them without danger of charging the drinking water with gases emanating from the closet; a danger so imminent in the present method of cisterns, which supply drinking as well as flushing water."

This lengthy extract will be excusable, on the ground that it depicts a perfect house, and yet one that can be erected by any person. Such a building, on a healthy site, can contain in itself no causes of disease, and can only become contaminated from some imperfections in the residences of your neighbors.

By this plan, the house can be also made much more comfortable and much handsomer.

The mind can be tranquil, and worriment a stranger, since you can calmly sit down, assured that you have the most thoroughly healthy house that the mind of man can conceive.

Since there is no necessity to sacrifice comfort and beauty in building such a home, I must urge all about to build to take this plan seriously into consideration.

CHAPTER VI.

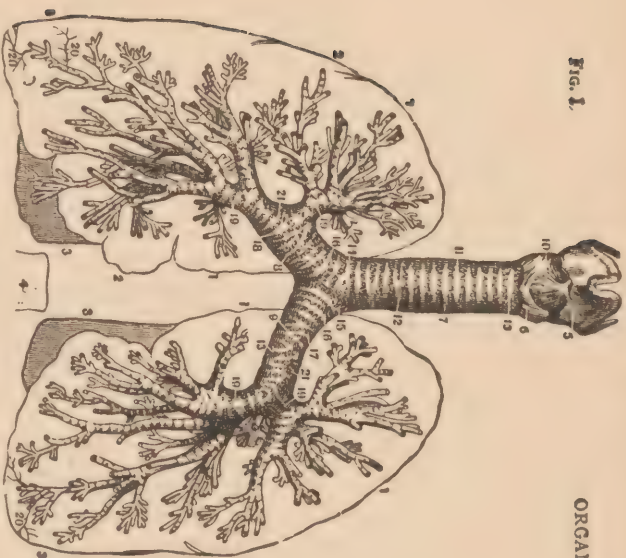
VENTILATION, AIR AND RESPIRATION.

Since an abundant supply of pure air is an absolute necessity of healthy life, I will now tell you something about ventilation.

Ventilation is one of the most important, and at the same time one of the most neglected agents in the prevention of disease, the maintenance of health, and the attainment of old age. The vast majority of persons know little and care still less about it. In the exceptional cases, where its importance is realized and it is sought after, its good effects are neutralized by wrong ideas and want of knowledge, so that instead of securing the good effects of plenty of fresh air, the evil results of exposure to cold air and draughts are experienced. Ventilation simply means the presence of a sufficient quantity of pure and life-sustaining air. It does not necessitate the air being cold or entering the room in perceptibly strong currents. On the contrary, a *draught* is nothing more than a *rapid current of air*, and even the most ignorant person has sense enough to know that he *ought* to avoid *draughts*.

Now, let me tell you why ventilation is so important. No sane person for one minute imagines that he can live without food; it is just as impossible to live without oxygen. In the chapter on alcohol I will tell you how oxygen purifies the blood in the lungs, and how it is the agent which gives power to act, through the agency of

FIG. I.



ORGANS OF RESPIRATION.

FIG. II.

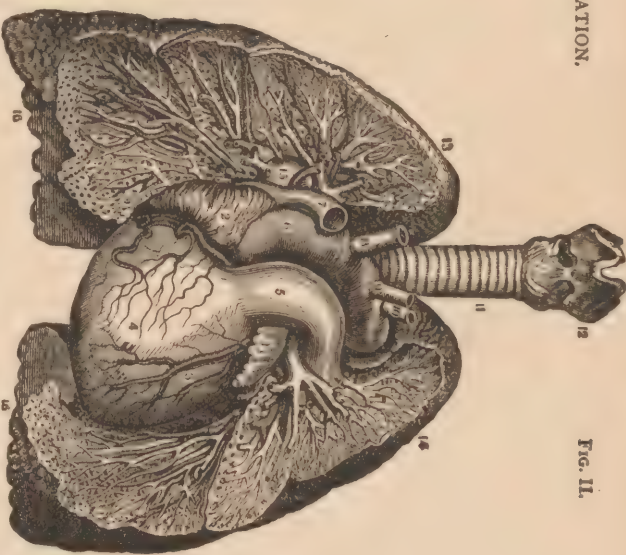


FIGURE I.—*The Larynx, Trachea, and Bronchia, deprived of their fibrous covering, and with the outline of the Lungs.*

1, 1. Outline of the upper lobes of lungs. 2. Outline of the middle lobe of the right lung. 3, 3. Outline of the inferior lobes of both lungs. 4. Outline of 9th Dorsal Vertebra, showing its relation to the lungs and the vertebral column. 5. Thyroid cartilage. 6. Cricoid cartilage. 7. Trachea. 8. Right Bronchus. 9. Crico-Thyroid Ligament. 10. Crico-Thyroid Ligament. 11, 12. Rings of the Trachea. 13. First ring of the Trachea. 14. Last ring of the Trachea, which is conical-shaped. 15, 16. A complete Bronchial cartilaginous ring. 17. One which is bifurcated. 18. Double Bifurcated Bronchial rings. 19, 19. Smaller Bronchial rings. 20. Depressions for the course of the large blood-vessels.

FIGURE II.—*A view of the Bronchia and Blood-Vessels of the Lungs as shown by dissection, as well as the relative position of the Lungs to the Heart.*

1. End of the Left Auricle of the Heart. 2. The Right Auricle. 3. The Left Ventricle, with its vessels. 4. The Right Ventricle, with its vessels. 5. The Pulmonary Artery. 6. Arch of the Aorta. 7. Superior Vena Cava. 8. Arteria Innominata. 9. Left Primitive Carotid Artery. 10. Left Sub-Clavian Artery. 11. The Trachea. 12. The Larynx. 13. Upper Lobe of the Right Lung. 14. Upper Lobe of the Left Lung. 15. Trunk of the Left Pulmonary Artery. 16. Lower Lobes of the Lungs.

The distribution of the Bronchia and of the arteries and veins, as well as some of the air-cells of the lungs, are also shown in this dissection.

the nervous system, to all those functions which constitute life. I will now tell you that it is one of the most important agents in removing from the body those dead and decayed particles whose presence in the system is prejudicial to health and inimical to long life. Many of these particles are carried in the blood into the lungs, in the form of carbon. If this carbon finds plenty of oxygen in the lungs (which will be the case if we breathe pure air), it unites with it to form carbonic acid, which is thrown out of the lungs in expiration. Again, the union of carbon and oxygen generates heat (just as it does in the stove), by which means the proper temperature of the body is maintained. You can now plainly see how necessary oxygen is. Then, let me tell you, that *ventilation* means nothing more than a proper amount of oxygen in the air which we breathe.

The principal ingredients of atmospheric air are oxygen and nitrogen. Oxygen *ought* to exist in the proportion of twenty-one parts in every hundred. The other seventy-nine consist of nitrogen, which merely serves to dilute the oxygen. Pure oxygen is too strong for ordinary use; it would cause such a combustion in the body that our stock of vital power would soon be consumed. Those who have read Jules Verne's sketch of *Doctor Ox* will be able to understand what I mean. His story is based on an exaggerated idea of this stimulating effect of oxygen. Dr. Ox secretly introduces this gas among the inhabitants of a quiet Dutch town. Its effects in vitalizing and quickening all the actions of the heavy, slow, phlegmatic people of the town are very amusingly told. Of

course, I do not mean to say that oxygen will produce all the effects that this Frenchman's imagination has depicted, but, in a very much less degree, it would do so.

The injurious effects from the presence of carbonic acid in the atmosphere will be understood when I tell you that if air contains more than six parts of this poisonous compound in every ten thousand, it is not fit for use and will poison the system.

From what I have already said, you will understand that carbonic acid gets into the atmosphere as a result of the decay of tissue. You will, very naturally, ask, what becomes of the enormous quantities of it thus generated? Here comes into play one of the many beautiful laws of nature. This gas, so very injurious to animal life, is the very food which vegetable life demands. Let us follow one hundred parts of atmospheric air in its journey and you will better understand me. We inspire, and the air rushes into our lungs, containing, as I have said, twenty-one per cent. of oxygen and seventy-nine per cent. of nitrogen. Five-per cent. of this oxygen passes into the blood, while at the same time an equal proportion of carbon leaves the blood and unites with some of the oxygen in the lungs, to form carbonic acid. When we expire, this gas is thrown out into the surrounding atmosphere. The vegetable life about us is hungry, and it immediately pounces upon this expired air and greedily absorbs the carbon, leaving the oxygen free and pure, and ready to be again inspired.

The average man will require three thousand cubic feet of air every hour, to maintain perfect health. A

room ten feet square and ten feet high will contain one thousand cubic feet. Natural ventilation, that is to say, by means of the window and door cracks, the porous walls, etc., will change and purify this air three times in the course of an hour. So that, in order to have a proper supply of oxygen, each individual should have a space ten feet square and ten feet high. If special means of ventilation are in use, this air will be changed six times in the course of an hour, thus giving us six thousand cubic feet, so that it would then be safe for two persons to occupy a room of the dimensions given above.

It is particularly necessary for children to have a sufficient supply of oxygen, because during their period of growth they are laying the foundation for their future life. As the twig is bent, so the tree will grow. If, during childhood, attention is given to their hygienic surroundings, they will grow into strong men and women, while, in many cases, any hereditary tendency to disease which may have been born in them will be stamped out. But if neglected, and an insufficient amount of pure air furnished them, they will grow into maturity, weak and sickly, while the development of hereditary disease in any weak organ or part will be much favored. Therefore, let me impress upon parents and guardians the necessity of a personal inspection of the school to which they intend sending children under their charge. If the school-room has not the improved methods of ventilation, they should make a calculation of the number of pupils, and of the number of cubic feet contained in the room in which this number of pupils will be confined, and if the result does not

show one thousand cubic feet of space for each pupil, let them look further, for a school that does. If improved methods of ventilation are in use, five hundred cubic feet will be sufficient for each child. While these amounts may possibly be a little more than is absolutely necessary to support a fair state of health, yet they represent a good standard, since in a matter so important as pure air we cannot allow our children too much; and in this instance a great deal too much of a good thing is decidedly preferable to even a very small departure on the other side.

Ventilation consists in an inlet for pure and an outlet for foul air. Many persons are so extremely sensitive to cold air that every window and door must be tightly closed as soon as a *cool* day comes. This morbid sensitiveness to cold, let me tell such persons, is a result of the bad habit of breathing impure air which they have contracted. By constantly taking into the lungs an impure atmosphere they have so interfered with the natural combustion of the body, and consequently the production of a proper amount of internal heat, their systems have become so vitiated and their bodily temperature fallen so low, that an outside temperature which would be only delightfully pleasant and bracing to a vigorous person, becomes to them positively cold and disagreeable. They sit in rooms almost hermetically sealed, breathing again and again the carbonic acid given out from their bodies, and in addition to this, inhaling also the same poisonous gas given off from the fire in the stove, which must remain to vitiate the atmosphere of the room, because everything is so tightly closed that it cannot escape. Let

such persons take a long walk in the country on a cool, bracing day in October or November, and I will stake my reputation that, if they are blessed with common sense, they will not return to the close room and foul stove until some extreme necessity for it arises. In the chapter on alcohol, I will tell you also that the excessive use of alcohol will so lower the natural temperature of the body as to make one very susceptible to cold. Air which has been used in the lungs is warmer than pure air, therefore it is lighter, and consequently will ascend. Hence your inlet for pure air must be low down, while the outlet for foul air should be near the ceiling. By elevating the lower and lowering the upper sash of a window, you can see how an inlet and an outlet may be procured. Let me say, parenthetically, that I am not writing this chapter for those who have the means to build and live in a house of their own selection. Such persons, blessed by intelligence, will, when planning a house, make a special study of the subject of ventilation, and secure all the latest improvements. But I am trying to assist the large majority of my fellow creatures, who must of necessity, and do, live in rented houses, or in houses built many years ago, when comparatively little of scientific ventilation was known. I am helping that large class of persons who, not having all they would desire, must, perforce, make the best of the limited facilities which they do possess. To continue, be careful not to have your bed in close proximity to this window, for if you do, you will be in a draught. I once saw an exceedingly severe case of lumbago developed in an overly zealous advocate of ventilation, by sleeping immediately beneath an open

window on a windy night. Be careful, also, not to have a second window or a door opened in such a position as to cause a current of air from the first window to pass over the bed in which you are sleeping. Remember that you may suffer bad effects from a draught that you do not feel.

I would recommend every one, even the most delicate, to provide some means for the ingress of fresh air into their sleeping rooms.

The following pertinent remarks are from the *Phrenological Journal*, they are headed "*That Bed-Room:*"—

"What about it? Well, a good many things might be said. It ought to be a place for quiet and refreshing sleep. But it is not. Restless tossings with troubled dreams are there. Morning after morning finds the sleeper weary, listless and dumpish. He wonders why it is so, *and we wonder too*. But our wonder is that he does not make it a matter of thought, and learn how to sleep as he should. When anything is wrong with us, *there is a cause for it*. After all, that particular bed-room does not differ materially from many others of its kind. Twelve feet long, ten feet wide, and seven feet six inches high, it has a capacity of nine hundred cubic feet. It has a door opening into the next room, and another opening into the hall leading into the stairway and hall below. One large window, with sash supported by pulleys and weights, affords, or ought to afford, air and light from out-doors. The fourth wall is solid. The bed stands in a corner, with the head to this wall. Two walls confine the exhaled air about the head of the sleeper. The breath of the sleeper is doubly foul, from late and full suppers,

and from ulceration of the respiratory membrane, caused by chronic catarrh.

In such a case, good ventilation is more than a usual necessity. Is it attended to? Take a peep at that room. Doors shut; windows carefully closed, to keep out night air. And yet this is a nice bed-room, genteelly furnished. If good sleeping is not done there, the failure is less chargeable to the room than to its management. How many cases of the kind have you met with?"

I do not intend here to treat scientifically of house ventilation. If you are about building a home, and desire to introduce into it improved methods of ventilation, I will refer you to the numerous works on ventilation, where you will find the question fully presented. This work would be rendered fatiguingly long if I were to treat of all the subjects contained in an exhaustive manner; so I merely throw out hints for your guidance, sign-posts, as it were, on the road to longevity. Ventilation in summer time is simple enough. We open our windows and doors in order to receive cool air into the house, and as a matter of course, the *pure* air from without enters in sufficient quantity; but when the cold, blustery, windy days of winter come upon us, we fasten our windows and doors, and close up every crack and crevice with weather-strips, so that it is impossible for any appreciable amount of pure air to get in, while at the same time the foul air is enclosed, and we are compelled to breathe and re-breathe air devoid of pure oxygen and full of carbon and other impurities. Weather-strips are very good inventions; I would recommend every one to use them, unless

their door and window-frames fit very closely ; if they do not, they will have dangerous draughts entering their houses, and it will be next to impossible to keep the rooms warm. But at the same time, you must provide some means for the ingress of fresh air. This can be safely accomplished by means of a ventilating flue placed in the wall, with its inlet low down. But here let me give you a caution. Do not let the air enter your ventilating flue from the cellar ; if you do your supply will be more or less damp, it will contain coal dust and a variegated assortment of cellar impurities ; to prevent this, carry a pipe or tight wooden box from the outside of your house, through a cellar window, and supply the air to your ventilating flue by this means. To go back to window ventilation ; if you do not occupy your own house, and live in a rented one, into which ventilating flues have not been introduced, remember that you can obtain a good supply of fresh air by raising a window, a very little. This may seem like repetition, but unfortunately, in these matters of health it becomes necessary to repeat, and repeat again, the smallest points, in order to get human nature to act on them. If you tell a man how to make money, he remembers what you say and acts upon it, and does not forget it ; but when you tell him how to preserve his health, he is very prone to forget what you have said, in the all-absorbing topics of more temporal interest to him, particularly if he be in good health at the time of receiving this information. Sick men are very willing, as a rule, to obey the doctor, and to do anything to improve their health. But men in health are very apt to disregard the very rules which

are sure to enable them to preserve their health. You remember the old saying :—

“ When the Devil was sick, the Devil a monk would be ;
When the Devil got well, the devil a monk was he.”

I once knew a gentleman who for years complained of ill health. During six years he must have consulted ten physicians. They all gave him good advice, which he neglected to follow. None of them really discovered what was the matter with him. He himself believed that he was suffering from dyspepsia, and considering this trouble so trivial, he neglected to follow the advice received, which, as it turned out, would have benefited him. Finally he discovered that he had a fatal and incurable disease. He was ordered a certain course of life, and when asked if he would follow it, answered, “ certainly, I will do anything, I will eat *ten-penny nails*, if necessary to cure me.” When he found that he was fatally diseased he was willing to do anything, but when he thought he only had dyspepsia, he wanted to and did do just as he chose. Therefore, I say, to make man live as he ought, it is absolutely necessary to reiterate over and over again that which he ought to do, until, by making these rules as familiar to him as his alphabet, you keep them ever before him, so that he cannot possibly forget them, and plead ignorance as excuse for his disregard of the laws of longevity.

To again return to window ventilation : a very slight elevation of the sash, a very small crack, will allow the entrance of a considerable quantity of air, while you can so sit as to avoid any draught that may come from this window, while it would be almost impossible to

avoid being in a draught if air was entering all the windows and doors.

Now, while the pure air is coming in, you must not neglect to have an outlet for the foul and impure air. As I have told you, air which has been once inspired is warmer, and consequently lighter, than pure air, and, as a matter of course, it will ascend; therefore, your outlet must be near the ceiling. If you are using a stove, or an open grate or wood fire in your room, you will not need any other outlet for the impure air. Let us follow a certain bulk of air, and you will better understand the fundamental point of ventilation. It comes in, let us say, at the window or ventilating flue, pure and cool. You take it into your lungs and it becomes warm; you expire it warmer and lighter than the surrounding air in the room, consequently it rises toward the ceiling, and carries its impurities (acquired in the lungs) with it. After hovering about near the ceiling for a while, it becomes cool, consequently heavier than the new volume of warm air (which in turn is rising), and by its own weight descends again toward the floor. The fire in your stove or open fire place heats the air in its immediate vicinity, renders it lighter than the surrounding air, and consequently it ascends through the stove pipe and is carried out of the house through the chimney, while nature, abhorring a vacuum, will draw in and cause to pass out in the same way the volume of air which has descended from the ceiling and is hovering about the stove, waiting its turn to escape into the chimney, and carry its load of carbon to the outside vegetable world, hungrily waiting to devour it. So, by this means a constant

circulation of pure air can be obtained with very little trouble and no extra expense. Let every one hang a reliable thermometer in the room, and see that the temperature never exceeds or falls below 70° Fah. With this temperature, some persons will feel cold; if they do, they can rely upon it that one of the two following conditions must exist: either they are not in vigorous health, or they have accustomed themselves to an unhealthily high temperature, and the sooner they come down to a healthy standard, the better. Many intelligent persons who try their utmost to live properly and to conform to all known sanitary rules, consider it absolutely necessary to have the windows in their sleeping-rooms wide open at night. Unless your bed-room is unusually small, or an unexceptionally large number of persons occupy it, this procedure is not only unnecessary, but absolutely injurious. Unnecessary, because, as I have told you, a room ten feet square and ten feet high will contain a sufficient quantity of air for one person, and natural ventilation without any open windows will change this air three times in the course of an hour, so that one person might sleep in such a room and have plenty of pure air without opening the windows; and dangerous, because, a wind-storm blowing up suddenly in the night might cause an injurious draught to rush through your room and sweep over the bed on which you are unconsciously sleeping. If, therefore, your room contains one thousand cubic feet for each sleeper, do not, at most, do more than slightly lower the upper sash, so that the impure air may get out. In the morning, when you leave your room, throw wide open all the

windows and hang the bed-clothing near them, so that the room may be thoroughly ventilated and all impurities from your bodies which may have accumulated on the blankets and sheets during the night may be thoroughly swept away before they are again used.

It is a matter of great importance that churches and public halls should be well ventilated, and a few words on this subject may result in much good. When a large number of persons are gathered together for religious worship or amusement, the dead matter given off from their bodies must be very great. For a time these small particles float about in the air of the room. If now the windows on both sides of the church are thrown wide open, a current of air crosses the building, and seizing these particles drives them out. But if the windows are not opened for some days, the specks, by their own weight, sink to the floor, so that when the windows are at last thrown open, the current of air passes over these impurities and cannot remove them. But when the congregation again assembles, the feet of the men and the dresses of the ladies will raise these rotten particles from the floor, and they will once more float about in the air, to be inhaled by and poison the human beings there assembled. Therefore, on Sunday evening, after the last service, every window in the church should be opened wide and left so until the next service. This opens up to us a new idea of the uses of ventilation. Besides furnishing oxygen and removing the foul air from our lungs, ventilation is designed to remove all bad elements whose presence in the air would be injurious. Many eminent writers on hygiene say that they would prefer to have a water-

closet immediately adjoining the sleeping-room, provided such closet were well ventilated, than to have it located in some remote corner of the house, and not ventilated. Therefore, you can see how much importance sanitarians attach to ventilation. Since the air of a house can be rendered foul and unfit to sustain healthy life by so many and such unsuspected causes, it becomes absolutely necessary that we should provide means of ventilation at all times, whether we have reason to suspect foul air or not. For your guidance, I will enumerate a few of the least prominently recognized causes of bad air; premising that all air impurities must arise from organic decomposition, or from mechanical ingredients; principally, and the most dangerous class, from the former. To say nothing about sewer gas, of which you hear so much, let me mention decomposing slops at the kitchen door, uncovered chambers in your bed-room, wet diapers hung up to dry by the heater, dirty clothes in closets, slop jars in bed-rooms, and so on I might go with a very long list; but suffice it to say, since I am addressing intelligent persons, that any dead organic matter must decompose, and when doing so must render the surrounding air impure. Now, then, ventilation will remove all this impure air, and substitute for it pure and wholesome atmosphere. I need say no more; I am sure you can understand now why ventilation is so necessary; you know what it means, and how to secure it. In a few words the whole subject of ventilation might be summed up, and I would put it thus: *Ventilation means the removal of foul and the substitution of pure air.* Before concluding, one word on water-closet ventilation, which I wish to impress on you, since, of course, sewer gas is

by far the most deadly of all atmospheric impurities. I do not care how well your closets are ventilated, I would urge upon every one the adoption of the following cheap and simple precaution: In the majority of bath-rooms the light (be it gas or lamp) is located just over the water-closet; well, have a tinsmith make you a tin pipe about $1\frac{1}{2}$ inches in diameter, terminating at one end in a large funnel-shaped opening. Suspend this opening over the light, and carry the pipe through some portion of the frame of the upper window sash, letting it terminate exteriorly in a vertical direction. Keep your light burning low *constantly*. The heat from the gas or lamp will warm the air in its immediate vicinity, and cause it to rise through the pipe and leave the room, drawing at the same time new air from other portions of the room to take the place of that displaced. By this simple device a constant flow of air will be maintained from the room to the outside of the house, and particularly will the foul air from the closet directly beneath the light be removed. This same principle may be advantageously utilized in other portions of the house.

In connection with ventilation, one word about sunlight. The influence exerted by the direct action of the sun on the human body is absolutely necessary to health. This is a fact not open to argument. Vegetables and flowers cannot thrive without the sun, neither can man. The sun may fade your curtains and your carpets, but its want will fade yourself and your children. Hoping that I have now made clear the purpose of ventilation, its necessity, and how every one can procure it, I will proceed to consider another portion of my subject.

CHAPTER VII.

HOW WE OUGHT TO WORK.

In the personal column of the *Philadelphia Times*, on January 14th, 1881, there appeared the following:—

“Mr. Philip Armour, the wealthy Cincinnati merchant, and Manager Carpenter, of Chicago, both of whom died a few days ago, lost their lives through *overwork*. Mr. Armour was thirty-eight years of age and worth about \$2,000,000, and Mr. Carpenter was successful at thirty-six years.” This pregnant personal will be the text for our chapter. I will enunciate once again what you have been told a hundred times or more, and know well, but still disregard, that *excessive* work of any kind (like excess in anything else), mental or physical, is injurious. Excessive work of all kinds is really the great bane of our country, as it unfortunately ever will be in all new, large and undeveloped countries, where the race for wealth and advancement is carried away beyond the bounds of judgment, and with total disregard to the rules of hygiene. Some persons there are who will work, and work, and work as long as they can, in spite of all contrary advice; but I feel sure that there are many persons, even in our overly active land, who would gladly direct their work with judgment if they only knew how. Of course, this book will not be of much use to those who are compelled by necessity to follow a certain course of life. Advantage from perusal of its precepts will be

chiefly gained by those who are so situated as to be able to map out their own lives and live as they desire. But even to those who must, as I say, work in a certain rut, so to speak, I will give some rules by the observance of which they may derive the least harm and the greatest amount of good from their work.

Let us first consider the merchant, whose office is usually some distance from his house. In the morning, after breakfast, let him for half an hour or so sit quietly and read the paper, instead of running from the house with the last swallow of food in his mouth, and rushing frantically for the first street car, as though the whole lower part of the city were in flames, and he the only man in the place who could extinguish them. By this means his digestion will commence decently and thoroughly, and he will have laid the foundation for sufficient strength to properly perform his day's labor. Then let him *walk* to his office. If several miles away, so much the better. If some valuable time may be lost to business in each day by this habit of getting to the office late, it will be more than counterbalanced by the increase in bodily and mental vigor when you do get there, and the number of years which it, in conjunction with the other simple rules of living, will add to your life. In the middle of the day (if you do not go home to dinner, and it would be better if you did and allowed plenty of time for it), take a full hour to your lunch and subsequent recreation before returning to your office. If you have money and are liberal, invite a congenial friend to lunch. His pleasant conversation will tempt you to eat slowly and to properly digest your food. If you neglect this meal, you will be apt to *gorge* your-

self in the evening, and ultimately to ruin your stomach by the extra work thus thrown upon it. A golden rule is to "*eat but a little at a time, repeat the dose often, and take this little slowly and at regular intervals.*" Avoid alcoholic liquors at this lunch, not only on account of their evil action *per se* (see chapter on alcohol), but because they may muddle your brain, cause you to make some error in your afternoon's work, and send you home in the evening with your brain full of anger and blood, and your stomach unfit to receive and properly digest your evening meal. Walk home from your office, and always try to have pleasant company in this walk. Do not discuss business matters together; talk on any subject disconnected with the business of the day; this will rest and refresh your brain, while the walking will exercise your body. Pass your evening in any pleasant occupation.

Let me impress upon you, parents, a very important consideration. When choosing an occupation for your children, observe carefully their inclinations; do not force them to a business or a profession for which they have no liking; let each one choose his own pursuit in life and follow it, unless it would be, beyond question, to his disadvantage to do so. Because it is a well-established fact that labor which is agreeable and not indulged in to excess is only good, wholesome *exercise* for the parts or organs employed, and cannot possibly prove injurious to health. On the other hand, *uncongenial* labor (if performed at all) becomes very hard and tiresome *work*, proving detrimental to the physical and mental well-being of the person so employed. Pleasant and agreeable work tends to promote health

and increase the length of life, because it furnishes to all the organs of the body just that amount of good and wholesome exercise which is most conducive to their proper, healthy and prolonged action, and at the same time, it keeps them from becoming rusty through want of use. While at the same time, every atom of work done which we do not like is performed through the agency of so much *force* exerted upon our unwilling organs and parts; hence, being *driven* to their work, so to speak, they soon become exhausted (a small amount of such *unwilling* work, constituting an *excess* of it) and predisposed to disease. This excess of work consumes an unnecessary amount of the vital force I have told you about, and so must have a tendency to shorten the duration of life.

Hufeland, in his excellent work on the "Art of Prolonging Life," makes the following statement:—

"It appears that all those who have attained to a great age were men who, in their youth, had been much accustomed to labor and fatigue."

My appendix will confirm this statement by actual and unquestioned experience; but in each case the labor has been congenial and the resultant fatigue wholesome. Our late distinguished fellow-townsmen, General Robert Patterson, who attained the advanced age of ninety years, in possession of all his faculties, enjoying to within a short period of his death very good health, and attending regularly to the requirements of an extensive private business, told me that he had been accustomed to much labor in boyhood, working on a farm, and always leading an active life. His individual experience will be confirmed by many

others in the appendix. I would advise merchants to see that those in their employ lead the life here laid down, so far as they can control their movements. By this course they will fulfill their conscientious duty to their employees, and will really derive more and better service from them. If they so arrange the hours of work as to render such a life possible, and add to this their good counsel and advice, they may do very much good, and be the means of prolonging many useful and valuable lives. The lives led by our poor bookkeepers in this country are simply terrible to contemplate. No one could possibly devise a more injurious or unhealthy life than that led by these poor victims to money. Their confinement, their dreadful position, leaning, hour after hour over their books, with their round shoulders and cramped and contracted chests, will produce more cases of consumption than any other single cause. Their lungs are so cramped by this position, that they cannot possibly fully expand as they ought to, when, from sheer want of use and inactivity, they waste away and consumption claims its victim. Our merchants should so regulate their business as to allow the bookkeeper time for exercise and pure air. It will redound to their material advantage in the long run. It may be enunciated as a safe average rule, that a man should not devote more than six hours out of the twenty-four to business, if he would desire to attain longevity. We would enjoy much better health, as a rule, if our business were to commence at ten o'clock and terminate at four. I am sure, from my own experience of business and business men, that in this length of time, devoted exclusively to really *hard business work*,

fully as much would be accomplished, in the long run, as now is in the very long, fatiguing days devoted to business, simply because these hours would be too short to allow of exhaustion, while every minute of them could be devoted to real hard work. Just here, I might say that one of the principal objections (from a sanitary standpoint) to sewing machines arises from this very same position which it is necessary to assume in using them, by which all the organs in the chest are so cramped that their free play is interfered with.

The same principles and methods of life as given to the merchant will be applicable, in the main, to the professional man and mental worker. There is one point, however, in which the mental laborer is particularly apt to transgress the laws of health. The professional man is very prone to reserve his writing and much of his reading for the evenings at home, and to continue his labors far into the night. This is very wrong. The evening hours should always be passed in some occupation or amusement diametrically opposite to the business of the day, and I would anticipate myself, to enunciate here, that, as a general rule, we would all enjoy better health if we ceased all labor or amusement and retired to bed at ten o'clock.

Let me caution the mental worker to vary the nature and kind of his employment. Excessive concentration of the powers of the mind on any one particular subject or kind of study is very fatiguing and injurious to the brain; it becomes hard work, and by its depressing influence on the brain and nervous system tends, by its reaction on the system at large, to produce derangement of the various organs thereof. In illustra-

tion of the truth of this statement, I will direct your attention to the premature decay, mental and physical, of so many of the heads and prime movers of our large corporations, whose minds are continually on the stretch, employed to excess in the same groove of mental exertion.

As the body requires a variety of food for its proper nourishment and healthy life, and could not exist long if confined to one single article of diet, so the brain requires a variety of mental food, in the shape of change of employment, for its lengthy and healthy life. An eminent physiologist once said, "It is not brain *work*, but brain *worry* that kills." This is certainly true. It is just as necessary for our brains to have a proper amount of exercise, which they receive from varied and pleasant work, as it is for our muscles to receive a sufficiency of exercise to enable them to properly live and last throughout a long lifetime.

I would recommend to brain workers who are not absolutely compelled to live in the city, to make their homes in the country, where they can have some ground around their houses. Such a man should select for his study the brightest and pleasantest room in the house, and ought to be very particular about its ventilation, since in it he will pass the majority of his working hours. He can keep poultry, dogs, a horse, and a variety of live stock. Every hour or so, in fair weather, he can vary his literary work by a short stroll around his grounds, among the animals; this will cause him to take exercise in the fresh air, which will be good for his body, and will relieve and refresh his mind, which will surely become exhausted by too incessant applica-

tion. These few minutes lost from work will be more than offset by extra vigor of the brain, increased power of application and clearness of ideas when he returns. By this simple means, a life of literary labor may be sustained for many years, and an immense amount of mental work accomplished, while *incessant* application will *surely*, beyond any possibility of doubt, use up the vital power and break down the body and mind before half as much work has been accomplished. "*All work and no play makes Jack a dull boy*," is a homely, but intensely accurate adage. Even a locomotive, a thing of iron and brass, requires periods of rest from active duty, or it will give out before its time; how much more imperative is it to rest the brain, an organ so delicate and sensitive that the prick of a pin or the effusion of a few drops of blood in certain portions of it may immediately cause a cessation of its life.

I would also recommend the literary worker not to confine himself to one room all the time. By moving occasionally from one room to another, his surroundings are varied, monotony of external objects will not weary and exhaust the brain, through the agency of the sense of vision; new objects meeting the eye, will refresh the brain and will vary the impressions which it receives, to say nothing of the numerous ideas suggested to it by this change of scene. It would be wise for the brain worker to perform as much as possible of his labor in the open air, when the weather is mild, of course. If living in the country, he can accomplish this by reading and writing in a tent on his lawn. He will thus be constantly supplying his body with one of its most requisite elements, oxygen, in the shape of pure air, and

to his mind will be giving its most healthy and harmless stimulant.

When reading or writing, endeavor to so arrange your book or paper that you can sit erect. By leaning over, you will soon become round shouldered, while what is gained in the size of your shoulders will be lost in the capacity of your chest, and all the important organs contained therein will be cramped, crowded and interfered with, more especially your lungs, which will not be able to take in a requisite amount of air. To the laboring man I can only say, when your day's work is over, spend your evenings with your family. If the weather admit, take them out for an airing. Pass your Sundays and holidays in the open air, in the public parks or make an excursion on one of our river steamers. One of the greatest curses and misfortunes of this and other countries (from a sanitary standpoint) is the bad habit, so common among the laboring men, of spending their spare time in the nearest grogery, poisoning their minds and their bodies, and wasting the means which ought to support their families, in *bad* liquor.

Of course, some occupations are more injurious to health than others; thus, painters are very liable to have colic and to suffer from a certain form of paralysis; workers in steel are apt to inhale small particles of this metal, which, irritating their lungs, may give rise to consumption, and so on.

In this connection, the following facts will be interesting. They are the results of a series of careful observations made in the hospitals of Breslau and Würzburg. They give the relative proportion of cases

of consumption occurring in workmen in various trades subjecting them to the inhalation of various kinds of dust:—

1. *Metallic Dust*.—Needle polishers, 69.6; file cutters, 62.2; lithographers, 48.5; sieve makers, 42.1; grinders, 40.4; compositors, 36.9; watch makers, 36.5; type founders, 34.9; engravers, 26.3; dyers, 25; varnishers, 25; painters, 24.5; printers, 21.6; belt makers 19.7; tinkers, 14.1.

2. *Mineral Dust*.—Flint workers, 80; grindstone makers, 40; stone cutters, 36.4; plasterers, 19; porcelain makers, 16; potters, 14.7; carpenters, 14.4; masons, 12.9; diamond cutters, 9; cement makers, 8.10.

3. *Vegetable Dust*.—Cigar makers, 35.9; weavers, 15; rope makers, 18.9; millers, 10.9; bakers, 7; chimney sweepers, 6.5; coal miners, 0.8.

4. *Animal Dust*.—Brush makers, 49.1; hair workers, 32.1; upholsterers, 25.9; felt mongers, 23.2; turners, 16.2; hatters, 15.5; button makers, 10.

5. *Mixed Dust*.—Glass blowers, 35; glass makers, 17.8; laborers, 15.1.

These figures may convey a hint to those predisposed to consumption, to guide them in selecting occupations.

However, when a man is about choosing a business in which to engage, the question of health is the very last consideration which he entertains. If sure he can make money, he does not stop to consider whether his health will suffer. Therefore, it would unnecessarily prolong this work were I to enter upon a discussion of the effects of the various trades upon health. If, however, this book should meet the eye of that remarkable indi-

vidual who values his health as he ought to, namely, above all else, and if he is about to embark in business or learn a trade, or if he desires to know whether the occupation in which he may be engaged is injurious to his health, let him ask his physician. I will relate just here a case that came under my own observation, to illustrate the importance of using judgment in selecting your work. In the same country neighborhood in which I used to live, some years ago, a young man was employed as salesman in a large country store. He was not naturally robust, and his confining work so reduced and exhausted his strength that after some years he became very sick. He had dyspepsia, and was threatened with consumption. His *wise* physician told him that medicine would do him no good, that he must change his mode of life; he was not sufficiently robust for such a sedentary life, and must find some occupation that would keep him in the open air. He commenced to supply the morning papers to the country people. At first his customers were few and his work light; but he was in the *open air*, walking from house to house. Gradually his business grew, and at the same time his *health and strength increased*, until at the present time, getting up at five o'clock in the morning, he commences his route, walking (up hill and down) nearly *fifteen* miles daily, and delivering the morning papers to more than eight hundred persons, carrying all these papers on his back. He tells me he never enjoyed such health as at present, and he is a good specimen of a strong, wiry, muscular pedestrian. Had he remained behind the counter he would, according to all sanitary laws, have died long since; as

it is, he seems to bid fair, unless he is the victim of accident, to reach a good old age ; and this in face of the fact that he was not naturally robust. Let me add, that for some years he has not missed a day's work, even in the worst days of our severest winters.

A few words, now, about farmers, and only a few, because it would be hard to imagine a more healthy style or mode of work than that followed by those who till the soil. Still, they make some mistakes, and I will point them out.

It is a curious fact, that we learn from the statistics of our insane asylums, that the majority of insane men come from the class of farmers. This is to be accounted for as follows : They are exposed to the intense heat of the sun, which, beating down all day long on their heads, produces a congestion that oftentimes results in derangement of the functions of the brain, or *insanity*. This is one of the evils that farmers have to guard against, and to do so, I would advise them to wear constantly in their hats, in contact with their heads, a sponge soaked in *cold* water, and to wet it freshly as fast as it becomes warm or dry. This will keep the head *cool*.

Another trouble that I have found very prevalent among farmers is *dyspepsia*.

This is frequently caused by the fact that they *will* go to work *immediately* after eating. We often see pictures of the noonday hour at a farm house, where the farmer and his men are represented as half reclining on a porch, the dogs lying around, and a beautiful landscape in the distance. This makes a very beautiful picture, but is not true to nature. On the contrary,

in my experience, the farmer will hurry down his breakfast and dinner as rapidly as possible, and hurry off to work. After supper, it is true, he will generally sit around and enjoy his pipe until bedtime, but the hasty disposal of the two other meals has overtaxed the stomach and produced dyspepsia. Therefore, I would in an especial manner advise the farmer to note what I say about all other points conducive to longevity, and not to forget the *wet sponge*.

We have erected our sign-posts to guide us in work. Let us now inspect them and see what we have. They surely are very simple and easy to follow. They may, indeed, be summed up something like this: Consider carefully and only undertake such work as is congenial, and do not do too much of it. When I advise you to reject uncongenial work, I must hasten to qualify this advice. I refer to the *main life work* of a man. In this world of care and trouble, we must all of us, very frequently, do work that we do not like; but we need not, and must not (if we desire health and success) decide upon some unpleasant occupation for our chief employment in life. The lover of literary work has no business to engage in trade. The natural born doctor, with an enthusiasm for the science of medicine, should not study law, while the young man who likes and develops an aptitude for mercantile life ought not to stunt his abilities by becoming a professional man. Still, I would here advise all parents who can do so to compel their children in early life to learn thoroughly some trade or profession. If they do not like it, and prefer mercantile life, let them indulge in the latter; then, if unfortunate in business, in buying

and selling merchandise, they will always possess a capital of information, which in a country like ours is sure to afford them at least a living. In this matter of work, after understanding certain fundamental principles, every intelligent man must, indeed, be a law unto himself. Some men can, of course, do more work than others, since some men are stronger than others. Therefore, each man must, intelligently and understandingly, gauge his particular ability for work, and work accordingly. Bear ever in mind what I have told you in the first chapter, that a stronger man may, by excessive work, exhaust his vigor even sooner than a weaker one, and form the estimate of your capacity very carefully. Remember, also, that by doing less work daily, and conserving your vital force, you will live longer, so that, in the aggregate, you will really accomplish more work and have more pleasure than if you had worked much harder. For illustration, let us suppose a man born with a certain amount of vital force; he devotes himself to literary work and labors fourteen hours daily; allowing four hours for meals and amusement, and six for sleeping. He accomplishes a certain amount of work, has very little pleasure (outside of his work), denies to his family the pleasure of his society, and finally dies at forty years of age. Now, another man with the same inheritance of vital force and mental calibre likewise chooses literature for a profession. But he *works* eight hours daily, gives three hours to his meals, five hours to his family and pure amusement, and sleeps eight hours. When he reaches forty years he has not accomplished quite as *much* as case No. 1, but he has done better work, since it has been the pro-

duct of an ever active and fresh mind; he has had much more real pleasure, and instead of dying, is a vigorous, hearty man, in his prime. He continues to work, and when he reaches seventy-five or eighty years of age, and dies, he has accomplished very much more work, has had much more enjoyment in life himself, has given much more pleasure to his family and friends, and has benefited the world and his fellow-creatures to a much greater degree than his neighbor, who, crowding on too much steam, did brilliant work for a while, but prematurely collapsed. This same suppositious illustration will apply to all workers, mental or physical.

To sum up, a golden rule, no matter what may be the nature of your labor, will be to *work as methodically as possible; to work until you are tired, and then stop; but NEVER under ANY CONDITIONS, carry your labor to the point of EXHAUSTION.* By intelligently observing the effect of work on your system, you can very soon determine just when and how much you can work without exhaustion, and when you have very carefully determined this point, you *must* arrange your daily life in accordance. Remember that all of us cannot possibly do the same amount of work, because all of us are not equally strong. You cannot, perhaps, work fourteen hours a day just because your neighbor does; that is to say, you cannot do so without detriment to your health; and the sooner we realize and conform to this comparative power for labor on the part of different men, the sooner will we all enjoy better health, and the average duration of life be lengthened. Therefore do I urge you again, consider your capacity when determining how much labor you will perform.

CHAPTER VIII.

HOW WE OUGHT TO EAT—CARE OF THE BOWELS—WATER.

"If thou to health and vigor would'st attain,
Shun weighty cares, all anger deem profane,
From heavy suppers and much wine abstain ;
Nor trivial count it after pompous fare,
To rise from table and to take the air.
Shun idle noonday slumbers, nor delay
The urgent call of nature to obey.
These rules, if thou wilt follow to the end,
Thy life to greater length thou may extend.
Should'st doctors need ? Be this in doctors stead,
Rest, cheerfulness and table thinly spread."

Of all the important duties of the human machine, surely eating is one of the foremost. Being (as all know) absolutely necessary to life, the way in which we eat will have much to do with our health and longevity. For example, if you eat in such a way as to unnecessarily tax your stomach in digesting the food, of course you will unnecessarily exhaust that organ, and predispose it to disease and early decay. It behooves us to take great care of our stomachs, since they are the mainsprings of life ; they are the chemical laboratories in which is generated life force, or the power to live.

As I have already written a small book on "Dyspepsia, and How to Avoid It," I will not here discuss the function of digestion, but will at once formulate for your guidance some simple rules, the faithful observance of which will make dyspepsia unknown, and will enable you to get from your stomach the greatest length of work of which it was originally capable:—

1st. Eat everything, except such articles as your own individual experience teaches you disagree with you, because the body of man requires a variety of nourishment, and could not exist if confined to one or two articles. Dr. Hufeland says: "In general we find that those men who were not too nice or particular in regard to their food, but who lived *sparingly*, attained to the greatest age," and "it is an advantage peculiar to man that he can digest and assimilate the most heterogenous kinds of nourishment, and is not, like other animals, confined to one certain class."

2d. Eat slowly and chew all of your food thoroughly, until it becomes pulpy, and mushy, and well mixed with saliva, before allowing it to pass into the stomach; because this is an absolutely necessary preliminary to perfect digestion. To do this effectually, you must take only a small quantity into your mouth at a time, and put no more in until the first installment has been thoroughly chewed and comfortably lodged in your stomach.

3d. Cease eating before your appetite has been thoroughly satisfied; because, though the sensation of hunger is, in the first place, the voice of the system demanding food, it does not follow that the stomach has not received enough material for the nourishment of the body until this voice of hunger is hushed, for you must remember that the food must first be digested before it can nourish your body, and that this process will require some little time. Therefore, you may have enough material in your stomach and still feel hungry, for, not being yet digested and taken up, it has not satisfied the wants of the body. In view of these facts,

a good plan will be, always to rise from the table with a *comfortable* feeling of satiety, but at the same time feeling fully capable of eating and enjoying *more* than you have taken. *By eating slowly*, you can easily determine when you have reached this point. For heaven's sake, *avoid stuffing*. Nothing can be more conducive to dyspepsia than the habit, so common among our people, of sitting down to eat and making a business out of it. With no intervals between the mouthfuls, they cram, and push, and force, and wash down with huge draughts of water or wine, large boluses of unchewed food, and never cease until they are physically unable to hold any more, until they are "*chock-full*." Is it any wonder they are obliged to unbutton their vests and even their pantaloons, to make room for their abnormally and enormously distended stomachs? They grunt and groan, are short of breath, say they have eaten too much, and in a few hours' time *stuff* themselves again. Is it any wonder that dyspepsia is so common among people so hoggish? Could it be otherwise? If you *stuff* an *iron furnace* with coal, you will ruin it in a short time; how much sooner will this occur with your delicate stomach. Even a horse knows when he has had enough, and no amount of persuasion can induce him to eat another grain of oats. Let me therefore, again beg of you to have as much sense as your horse, and to learn when you have eaten enough and to stop there. Do not let your palate run away with your intelligence and ruin your stomach. So, once more, *do not stuff*, or you will surely have dyspepsia.

4th. Do not commence a meal when over-heated,

over-fatigued, very much excited with anger or any other emotion, or very much depressed. Because the stomach, being unfavorably impressed by, and participating in, all of these conditions, will be unable to properly perform its duty.

Under this rule it will be well to say a few words about the terrible American habit of *restaurant eating*. A few weeks ago, I went with a friend into one of the numerous eating-houses near Third street, patronized chiefly by bankers and brokers. To describe accurately the scene there presented I am not capable; but I will tell you some little about it. The room was handsomely, even elegantly fitted up, the food appeared to be well cooked, but the poor victims! As I sat eating a sandwich, the door would be thrown open, and in would rush a man, evidently in a state of great excitement, having, in all probability, passed the morning amid the turbulence, worry and anxiety of the Board room. His stomach, I must tell you, was as excited and irritable as his brain. He would go first to the *tape*, to see the latest stock quotations; with the paper in his hand he would call out his order for lunch or dinner, as the case might be, then to the bar, where he swallows a large dose of brandy or whisky, or the like, then to his lunch, which is swallowed hastily and with little or no chewing; this process being intermitted several times for inspection of the tape upon the arrival of fresh quotations; he then lights a cigar, takes a last look at the tape and hurries out. He has been in the restaurant not more than ten or fifteen minutes; he cannot spare any more time, for he must get back to the Board. Can such a meal be properly digested?

Your common sense, unaided by medical knowledge, will answer this question in the negative. There are some exceptions to this rule, of course, but what I have told you is the *rule* among bankers and brokers. The business hours for these gentlemen are from ten to three. They would have less dyspepsia and enjoy better general health if they would eat a hearty breakfast, say at nine o'clock, *then walk to their offices*; this would allow nearly an hour, in which time digestion would be fairly commenced, before the business and worriment of the day began. Eat nothing at mid-day; after three o'clock walk leisurely and quietly home, which would allow time for the excitement of the day to subside, and bring their stomachs into proper condition to receive and digest a leisurely eaten and thoroughly masticated dinner at four o'clock. Bankers and brokers, try this method. Make it a rule to allow at least a full hour for dinner, and do not permit anything to interfere with this rule. Apropos of this suggestion, I will relate an anecdote to point it: A very prominent surgeon (one of the most eminent in the United States), now considerably more than seventy years of age, yet actively engaged in an extensive practice, and performing much literary labor besides, had made it a rule of his life to allow a full hour for his dinner, and under no consideration, no matter how pressing, to deviate from this practice. One day, shortly after he had commenced dinner, a very wealthy and influential banker came to his office to consult him. He was told that the doctor was at dinner. Time being valuable to him he sent in his card, considering himself of sufficient importance to interrupt this meal. Word was returned

that the doctor was at dinner and would be out shortly. The banker waited fifteen minutes, and becoming impatient, sent in a second time. The same word was returned. After nearly half an hour had elapsed, word was sent in a third time. The doctor then said, "tell Mr. So and So, I am at dinner and will come out when I am through and not before, and if that does not suit him he can go to the Devil." This message, though not very elegant, was very forcible, and demonstrated how important to this great physician it was, to have plenty of time for an uninterrupted dinner.

5th. Above all things, be REGULAR in your habits of eating. Always have your meals at the same hours. Take plenty of time for them, and occupy your mind while eating with light and pleasant conversation. Heavy reading, or any mental occupation requiring much brain work, if indulged in while eating, will be very injurious, because it will have a tendency to draw blood from the stomach to the brain, and for proper digestion to take place, it is necessary for the stomach to have plenty of blood.

6th. In warm weather avoid or use sparingly oily and fatty articles of food, because they are both unnecessary and positively injurious. Unnecessary, because their principal duty is to produce heat, and the outside temperature being high, you need but a small production of internal heat; injurious, because their particles not being consumed in producing heat, it becomes the duty of the liver to remove the excess of them from the body; hence, if you use such food freely in warm weather, you give the liver too much work to do, and it becomes exhausted and eventually diseased.

To carry out this rule in an easy way, let me suggest to you to reduce or entirely abandon the use of butter and gravy in summer.

7th. Avoid excessive exercise, either mental or physical, for twenty minutes or half an hour after you have finished a meal, because any exercise will tend to draw the blood away from the stomach toward the organ or parts so exercised, and thus interfere with digestion. The "*Otium cum dignitate*," the "*Dolce far Niente*," the *after-dinner cigar, cup of coffee and light conversation*, the *lolling about*, the *comfortable laziness*, call it what you may, is a mighty sensible institution. Through its agency, during this period of passive life of repose and quietude, your stomach seizes hold of your food and commences vigorously to digest it. Relieving, as I do, that tobacco is a poison, I would still advocate the use of an *after-dinner cigar*, if by its influence a man could be kept quiet and passive for half an hour; because I believe the injury done to his nervous system by the tobacco would be more than counter-balanced by the good done to it and the body at large, from the more perfect digestion which would result from this half hour's repose secured by the agency of the cigar. Do not, however, go to the other extreme and fall asleep. If you do, your stomach will also "*go to sleep*," as it were, and your food will not be digested. A *heavy nap* after dinner is a very bad institution, and is the cradle of dyspepsia.

To repeat, *do not go to sleep, but make yourself comfortable; and do not forget that if you eat TOO MUCH it will be impossible to make yourself comfortable; therefore, pay particular attention to RULE THREE.*

8th. In such a climate as ours, three meals a day should be the rule. Breakfast, as soon as dressed in the morning, should be a substantial meal, because it succeeds a long period of fasting. Dinner, *the* meal of the day, should be eaten some time between noon and two o'clock; a light supper in the evening. Many persons will object to a midday dinner, because, they say, it makes them drowsy and unfit for work. If it does, they can rest assured that they are eating too much; they are gorging themselves. Eat less, and you will be equal to a good afternoon's work. I think it was the "*Sage of Chelsea*," Carlyle, himself a sufferer from dyspepsia, who said that the surest evidence that one had a good stomach, was to be found in the fact that he was ignorant that he had a stomach at all. Whether or not Carlyle made this statement, it is eminently true; a thoroughly sound stomach will digest your food without letting you know anything about it, and if you are cognizant of the fact that digestion is taking place, from any unpleasant sensation about the stomach, your digestion is not *perfect*; and if your stomach is sound, your general health good, and your appetite large, and yet you feel an unconquerable drowsiness or heaviness after eating, depend upon it, *you are eating too much*; you are receiving a warning; your stomach is whistling "*down brakes*," and if you heed not the signal *dyspepsia* will be the result. Let us divide the day, and arrange the meal hours in the manner that would be the healthiest for the average man. Suppose he takes his breakfast at seven o'clock, his dinner at one, and his supper at seven. Suppose he gets up at six and retires to bed at ten o'clock. His

period of active, waking, working life would then be sixteen hours. Thus would elapse a period of six hours between breakfast and dinner, and six hours between dinner and supper. Between supper and bedtime would elapse three hours, and between rising and breakfast one hour, making four in all. When we are asleep, all of our functions are much diminished in the intensity of their action, merely acting sufficiently to maintain life; the voluntary functions are entirely at rest, while the involuntary phenomena of life are working at very low pressure. So that the sum total of the destruction of tissue (requiring food to repair the waste) which occurs during the eight hours of sleep would not probably exceed that which would occur in two hours of waking, active life, when all your functions, intellectual and physical, are in full activity. So that from supper at seven until breakfast at seven there would elapse a period during which there would take place a destruction of tissue equaling in amount that which would occur in each of the other intervals between meals. Hence, you see, we would have in the above regimen an accurate division of the twenty-four hours into fasting or inter-meal periods of six hours duration.

9th. *A golden one. Never eat between meals.* Because it is absolutely necessary for your stomach to have periods of rest and repose, and if you are constantly eating, you are also constantly giving your stomach work to do, and robbing it of its needed rest. Divide your day into the periods I have given you, and do not (except in rare and exceptional cases) eat even a cracker between meals.

10th. Do not use artificial appetizers. They are the

inventions of the Devil and contain the seeds of dyspepsia. The habit of drinking a *cocktail* to produce an appetite is most reprehensible and injurious. In the majority of healthy men who resort to the *cocktail* before breakfast, as an appetizer, the want of appetite is due to *excessive* indulgence in alcohol the night before. Now, this alcohol interferes with the proper tissue changes; much of the dead tissue has been retained in the body, because the alcohol consumed all the oxygen, and thus prevented the oxidation and removal of this tissue. The whole system is oppressed and depressed by the retention in it of this useless and decayed material, and in this general depression the stomach shares. The stomach is also in a state of inflammation, from the direct contact of the irritating alcohol. Therefore, it is not in a fit condition to digest a breakfast. It is absolutely necessary that it should have rest, in order that its inflamed condition may subside, just as necessary as it would be to rest an inflamed eye. It would, therefore, be better for such a man to go without breakfast. If he does not, his stomach will not thoroughly digest the food; it will lie heavy and undergo putrefactive decomposition, and the resultant rotten mass will still further irritate the stomach. It would be much better for a man who has over night indulged to excess in alcohol, to drink, upon rising in the morning, a bottle of Congress or some other strong saline mineral water; this will act on his kidneys and bowels, and will remove much of the dead tissue; he should then pass the morning in the open air, as far as possible; this will insure to his lungs a liberal supply of oxygen, which will remove from his

body the poisonous alcohol, and will oxidize and remove much of the product of the transformation and decay of tissue. By these means, the load which has oppressed his system will be surely and gradually removed, and by noon (if he has risen early) his body will commence to feel the necessity for food, and appetite will appear. He should then eat very slowly, carefully, and sparingly, because his stomach is still very delicate, and will require careful nursing for some time, in order that it may regain its original vigor. Milk, as one of the lightest and most easily digested foods, will be the most appropriate article to commence with. And let me tell you here, that it is a mistaken idea to imagine that the *richer* the milk the greater the nourishment to be derived from it. *Skimmed milk*, as a rule, is decidedly more nourishing than *cream*, because cream consists almost entirely of butter, which in turn contains little else than carbon, the element useful in generating heat, but of no nutritious value. On the other hand, skimmed milk has had all of this carbon removed from it, while it is rich in nitrogen, the element that makes tissue. So that if the weather be cold, it may be well to drink unskimmed milk, because you will then receive the nutritious element, nitrogen, and at the same time will supply to your vital furnace fuel, in the shape of carbon, wherewith to maintain the temperature of your body at its normal standard. But, if the outside temperature be high, as in summer, skimmed milk should be used; if you use cream under these circumstances, and so receive carbon into your body, it will not be required to maintain heat, and extra work will be thrown upon your organs to remove

it. In order to give your organs their requisite rest, no unnecessary labor should be imposed upon them. They have enough to do in maintaining the ordinary phenomena of life.

11th. Do not eat just before going to bed. Your stomach is a patient slave and a faithful servant. If you impose a task upon it, it will use every possible effort to perform the duty. When night comes, your stomach is tired out and exhausted from its long day's work, and wants to go to sleep. If you put food into it and order the process of digestion to commence, your patient stomach makes an effort to obey; but it is so exhausted that it is utterly unable to properly do its work, and dyspepsia ensues. Still more, its faithful friend and ally, the brain, resents your cruel injustice to its comrade, and as a punishment for your indiscretion, tortures you with *nightmare*, as though to say, if you are foolish enough to rob your stomach of its needed rest, I will play the same game with you. I will disturb, and make uncomfortable with hideous dreams, your sleep, and see how you like it. Seriously, in the majority of cases, nightmare is nature's protest against an overloaded and abused stomach, and its warning should be heeded.

12th. As a rule, it will be better, other things being equal, not to eat when you are not hungry. As I have already told you, appetite is the voice of the body demanding nourishment, asking repair for its waste. If you are in health, and this demand does not exist, it will be because your body does not require nourishment, it has enough, therefore eating under these circumstances would be gorging, and would be unwholesome.

If you live a *regular* life, as you should, performing the same amount of work each day, and sitting down to your meals at the same hours, appetite will generally be present.

Mr. Ernest Hart thus writes, in the *Sanitary Record*, of London, England:—

“The breakfast is probably the most important meal of the day.

“The skilled cooking of economic materials affords a theme on which it is popularly supposed to be easy to preach, and far from easy to carry doctrine into practice. I shall speak only of the mode of preparation of the very simplest and cheapest kinds of food in the simplest and cheapest way. I shall begin with breakfast, and breakfast foods. I should like to see the tea-pot abolished from the breakfast table. I believe tea to be a drink utterly unsuited for an early morning meal, and one which has only come into general use because it is the easiest sort of hot infusion which bad cooks, careless housewives and thoughtless mothers can prepare. Breakfast should be digestible, warm, abundant, unexciting, nourishing. I am not going to quarrel with bread and butter, especially other people's. It is a typically good food, though not always presented in the most agreeable form, and far from being the most appetizing or cheapest of its class. Bread and butter and hot cocoa make a very good breakfast for working people, but not perhaps the cheapest they can get, or the handiest. I believe very firmly in our good English household white bread. One hears a good deal, and reads a good deal, of the waste in grinding off the outside husk, which contains nutritious gluten.

The apparent economic waste is palpable enough. On the other hand, the silicated husk of all cereals is apt to be irritating. It hurries the digestion, quickens the passage of food through the intestinal tract, and I am inclined to believe that the actual physiological waste is greater in a brown bread than in a white bread diet. It is easy to take a superficial view of this question, and superficial reformers are always wanting to turn the world upside down. The instinct which has led to the preference of white bread over brown, in places where the two can be had side by side, is nothing else than the crystallized experience which has taught people unconsciously that they are more comfortable after eating the white bread, and that the solid household bread, which is the staple food of the working classes of this country, is in the end most sustaining. A good deal is to be said in favor of some of the forms of "whole meal bread," in which the husk is partially ground off, and the inner pellicle of the grain is very finely ground, and mixed in that condition with the white flour. Moreover, it is undoubtedly a fact that under certain circumstances, in lymphatic temperaments, and in conditions tending toward scrofula, where the diet has to be carefully supervised, and in certain forms of dyspepsia, where something like mechanical excitation of the intestinal tract is useful, whole meal bread is an extremely valuable article of diet. But those are cases which I am not considering. For the working man, for the poor man, and for every day use, I doubt whether anything has yet been produced in any country of the world which is equal to the English household bread. But when we pass out

of this category, and come to consider what is to be the cheap, warm, nourishing breakfast with which, at the least trouble and smallest expense, and with the greatest success, we can nourish our children, ourselves, our servants and our laborers, then we have to consider the claims of an immense class of cereals, of which, to our shame, we make but little use in this country, and thereby suffer a great economic and hygienic loss. Wheat is a costly cereal, and is not the most nourishing, nor does it lend itself well to those pleasant, wholesome, nutritious and comforting forms of food known as porridges, which do form the staple breakfast throughout Scotland and throughout the vast American continent, which is now peopled with English, Scotch and Irishmen, and from which we have so much to learn and so much to gain * * * * Hominy porridge is the staple breakfast of the American continent. For young people, for reasonably quiet people, for dyspeptics, for working people, for bankers and brokers, who want to keep their digestion in good order, and to be able to work satisfactorily, hominy porridge is the only food ; hominy is nothing else than a fine kind of Indian corn, ground roughly and largely, like Scotch oatmeal, and the way to make the porridge is to soak it in cold water all night, and to boil it for half an hour in the morning, stirring it frequently, to prevent it from burning. When boiled, each grain should be soft and separate, like well-boiled rice. It should retain its opaque whiteness, and should not be watery or semi-transparent, or else it may be known to be overcooked. Neither should it run in masses, or coagulate in lumps ; all these are the indicia of bad cooking.

They may be easily avoided, and hominy which does not come up to table with every grain soft and separate, and showing a pure, opaque, pearl-like whiteness, should be sent down again and devoted to some other use, such as frying in slices. When served in a hot bowl (with a pile of hot plates), it is best eaten with milk and sugar by the luxurious. To children and simple-minded people it is delicious with skim-milk and treacle, and of all the cheap, wholesome, digestible, delicious breakfasts which the world affords, I do not know any which can compare with a dish of hot hominy, with skim-milk and golden syrup. It would delight the heart of any British child. There is no epicure who retains a palate capable of appreciating simple purity of flavor, or a mind capable of appreciating the best gifts of nature prepared for gastronomic enjoyment, who will not find in such a dish of hominy one of the most perfect luxuries which could be put before him. I should like to hear that some of the royal children take hominy, skim-milk and golden syrup every morning for breakfast. It would make it fashionable, and such a dish requires only to be fashionable in this country, to become universal, and to be as popular in the palace as in the peasant's cottage. One practical inconvenience is sometimes found in preparing porridge, and that is the necessity of steeping the hominy over night, and spending half an hour in boiling it in the morning.

MACCARONI.

"Maccaroni makes an excellent variety in the scarcity of vegetables, and should be much better known, and more used by the masses here. It is the staple food

of the common people in Italy, indeed, of most classes. It is made of strongly glutinous wheat flour ; hence is flesh-forming, while its starch supplies heat. It may be cooked tender in boiling water, seasoned with salt, and eaten with or without cream-sauce, or milk and butter. After boiling, it can be put in a pudding dish, with about a quarter its weight of grated cheese sprinkled over it, and lightly baked. The addition of cheese makes this diet about equal to lean meat as a flesh-former.

PEAS.

"Ripe peas should be more commonly used. A bowl of good pea soup is as satisfying as a hearty dinner on a cold day. To make a gallon of it, wash a pint of peas and soak them over night, then boil in five pints of water, gently simmering three hours or so, until thoroughly soft. With a potato masher rub the soup through a colander or wire sieve. A pound of beef or ham bone may be boiled with the peas. The soup may be seasoned in various ways—with onions, cloves, pepper, sugar, any or all of them—to make it more palatable. Bean soup may be made similarly.

CARROTS.

"Stewed carrots are a far more nourishing and economical human food than is generally known, and they should not be mainly left for animals. Scrape the roots, chop into small pieces, and stew in water until very tender. They may be seasoned with flour and butter sauce—all the better with cream added—and in various other ways. Some like them piquant with a dash of Cayenne."

These few rules, simple as they seem, if rigidly ad-

hered to, will keep a healthy stomach in a healthy condition for the longest possible time. Disregard of them will surely, sooner or later, produce dyspepsia. Remember that I am writing this book for healthy persons, in order that they may remain healthy. Invalids must consult and obey the advice of a physician, though even to many of them, who have no specific disease, the directions contained in these pages will bring restored health.

A few words must be said about the care of the bowels. When you put food into your body, you must at the same time remember that after having served its purpose it must be removed.

As you can understand, this food is received for a purpose, which is to furnish the power of life to the body, and when this purpose has been accomplished, when this food has done its duty, it has no more business in the body, and must be removed. From what I have said in the chapter on drainage, you can understand how essential it is that all dead tissue should be removed from the body. One of the principal ways in which this removal is effected is by the bowels. Since I have already written a work on *Constipation*, I will not here go into detail concerning the function of the bowels. It will be sufficient for me to say that *full, free*, daily evacuations from the bowels are necessary to health. To secure such the following rules are necessary:—

1st. Always go to the water-closet at the same hour; *regularity* is a very important factor. If you have been constipated for some time, it will require some time to get your bowels into good order. Therefore, when

you seek the closet, strain gently (if you strain severely you will do yourself harm), sit a few minutes, and if you do not succeed in having a passage, do not get worried; wait until next day; go again and strain again; if you will persevere in this habit of regularity, in conjunction with the other rules I will give, you will soon find that the desire to have the bowels emptied will become manifest each day at the expected time. When you have succeeded in bringing about this fortunate condition of affairs, you must be very careful not to neglect nature's calls; because, with bowels inclined to costiveness, one day's neglect of natural demand may totally disarrange the bowels for many weeks.

2d. Drink plenty of water. Many cases of constipation are due to neglect of this precept. If you do not drink enough water, the contents of your bowels become hard and dry, and so are incapable of being expelled; while, on the other hand, if you use water freely, this mass will be rendered so soft that it can be easily expelled. I will tell you something about water in this chapter, and if you are careful to follow my advice, and procure *pure* water, you can drink it without limit.

3d. Always eat some fruit before breakfast, and after the fruit, before eating your meal, drink a large tumbler of cold water.

These three rules are very simple, and yet if faithfully persevered in, they will overcome any case of constipation. Constipation breeds dyspepsia, dyspepsia breeds nervous derangement, nervous derangement breeds disease of all the vital organs; therefore, con-

stipation is capable of producing very serious disease, and ought to be avoided. Follow these simple directions *faithfully*, and your bowels will be moved daily.

WATER.

The following remarks about water were made by Dr. N. B. Sizer, before the Medical Society of the County of Kings, N. Y., in March, 1882, and as they cover the ground thoroughly, I here reproduce them:—

“An article in a prominent New York newspaper, which appeared last summer, entitled ‘Pure Water, and How to Get it,’ deals with a question intimately concerning the health and well-being of every one, but does not treat the subject as accurately as its importance demands.

“The following statements were made explicitly or by implication, viz.:—

- ‘1. Pure water is distasteful.
- ‘2. Health does not necessarily demand its use.
- ‘3. Water may contain “hardly a trace of impurity” and yet be dangerous to use.
- ‘4. It is comparatively easy to get good water in the country.
- ‘5. “Croton” water is “as pure as could be expected,” and yet not always “fit to drink.”’

“Statement No. 2 is almost entirely false; the others have a grain of truth in them, but are calculated to give wrong ideas and do much harm among those uninformed on sanitary matters.

“I feel called upon, considering the importance of the subject, to beg the indulgence of this Society, while I endeavor to state what SCIENCE teaches us about drinking water.

“Chemically pure water is generally to be found only in the laboratory, as the chemist is the only one who absolutely requires it; but rain water, falling through a clean atmosphere, is very nearly pure, containing, however, substances washed out of the air, as oxygen and carbonic acid, traces of nitrates, ammonia, H. S. and sulphuric and sulphurous acids, besides dust and particles of various origin, not, however, of a nature or in quantity great enough to be usually deleterious to health.

“Other kinds of water, as spring, rain, pond, lake and sea water, all contain varying proportions of these impurities, frequently sufficient to be harmful.

“Oxygen may be considered as only *chemically* an impurity, being not only harmless to *man*, but also the ‘breathing material’ for fish, without which they could not live.

“Carbonic acid is inert, as regards ingestion, and gives the brisk, sparkling appearance to spring water, and to the falsely so-called ‘Soda water.’ Although it is innocuous *per se*, its presence in potable water is always to be regretted, since its presence in a stream flowing over a limestone country enables the water to dissolve a large amount of salines otherwise comparatively insoluble.

“It is found by experiment that *pure* water is able to dissolve only 7 or 8 grains of carbonates per gallon, but that the presence of $C O_2$, enables the same amount of water to hold in solution over 250 grains of these salts.

“‘Hard’ water is pure water containing certain dissolved salines, *not* useful as food to a healthy man, injurious to the health if persisted in, and, so far as we

know, useful, medicinally, only when the health is deranged.

"Certain it is that no *sane* man would think of adding 'Epsom,' 'Glauber,' or 'Rochelle' salts to his tea or coffee, to 'improve its flavor,' and yet this is practically what all do who use 'hard' water, these *hard* waters being merely weak solutions of various sulphates and carbonates.

"Pure water exposed to a clean mountain air in a desert country, away from human contamination, lying in a granitic or other insoluble basin, makes the most grateful of beverages, carbonic acid, if it be present, adding a peculiar freshness to its taste.

"There can be no doubt that health *does* 'demand pure water,' and that a water not appreciably 'pure,' in a *chemical* sense, is unfit *hygienically* for use.

"This is easily understood when we estimate the amount of these impurities that are taken per day. The Thames water, containing say 20 to 25 grains per gallon of carbonates and sulphates, would compel each adult using two quarts daily to swallow 10 to 12 grains of salines, whose average medicinal dose may be stated at 4 to 5 grains, thus getting a fair dose three times a day. Many wells contain 50 to 60 grains per gallon of alkaline carbonates, and it would be easy to compute in the same way the dose a thirsty soul would take during our sultry August days.

"As a matter of course, persons accustomed to pure water are apt to suffer from diarrhœa or some enteric difficulty on being compelled to use these saline waters; but as in the case of tobacco, opium, whisky, or any other poison, use breeds tolerance.

“If we consider for a moment the function subserved in our economy by the water we drink, we shall see very forcibly why hard water does us harm. Leaving out of the account the water lost by transpiration through the lungs and skin, we may state, in a general way, that the use of water is to *wash the blood clean*—that is, to dissolve and carry out of the blood the waste materials picked up by the blood, which are *soluble* in water. Now, we all know that a liquid can only dissolve a *certain proportion* of any solid; therefore, if we partly destroy the solvent properties of our potable water by *previously* putting into it from 10 to 50 grains per gallon of various salines, it is easy to see that we destroy its power of dissolving and removing from the blood anything like the proper amount of waste material, and that, if it be thus overloaded with dissolved salines, the water will be very apt, like an exhausted laborer, to *drop part of its load* the first chance it gets.

“These deposits occur in very important and delicate organs—notably the kidney, ureter, and bladder, forming the diseases so common in lime-water districts—‘*gravel*’ and ‘*stone in the bladder*,’ or ‘*urinary calculus*.’

“Another but almost as important point is the effect produced by the alkaline nature of most hard water.

“The reaction of the urine in *health* is *acid*, and in many diseases, *alkaline*—the alkalinity being also easily produced by taking alkaline medicines, ‘hard’ water also producing this effect.

“Accordingly we find that, in seasons when the London water is particularly hard, many physicians find it necessary to put patients suffering from digestive,

intestinal, and renal diseases upon *distilled water* as a drink, exclusively, and with the happiest effects.

“Reverting to the subject of calculous diseases, we shall find that a geological map of Great Britain shows beds of chalk and allied carbonates extending along the eastern coast, running as far north as Scotland. This fact explains why we read, in Holmes’ ‘System of Surgery’ (perhaps the best-text-book on the subject in the world), the remark that ‘calculous disorders are extremely prevalent along the eastern coast of this country, and are found as far north as Scotland’—that is, wherever the soil is full of carbonates of soda and lime, the water will dissolve it, become ‘hard,’ and produce calculi in the inhabitants. There is reason to believe that other diseases are influenced by the use of calcareous water, as seen in the ‘Crétins’ in Switzerland, and the prevalence of goitre in Derbyshire, a county notorious for water contaminated by earthy salts.

“In the ‘Report of the London Board of Health on the Water Supply,’ 1850, it is remarked that, ‘since the supply of soft water to this city, urinary and dyspeptic complaints are less frequent, continued fevers *more seldom and less severe.*’ (This includes typhoid, typhus, and relapsing fevers, of course.)

“Dr. Paton, of Paisley, Scotland, has noticed that since the introduction of soft water into that town (which formerly depended upon calcareous wells), calculous disorders are very rare, while formerly they were very numerous. He has also noticed that in the two cholera epidemics those families using well-water were far more severely afflicted than those supplied

with the city water, very pure and soft. One very instructive case he notes: Cholera broke out in a suburb, built high and dry on a limestone ridge, the air pure and bracing, drainage excellent, but the water mostly derived from wells sunk in the rock. Few persons here escaped cholera, except a family here and there who had no well, but depended upon the city supply.

"After the epidemic at Paisley had subsided, it was found that there had been 848 cases of cholera, and it was estimated that the district supplied by wells contained only about $\frac{1}{8}$ of all the inhabitants of the town, the other $\frac{7}{8}$ of the people using city water. It was found that this $\frac{1}{8}$ that used well-water had no less than 502 cholera cases among them, while the other $\frac{7}{8}$, who used pure water, had only 346 cases—that is, taking the average rate of illness among the $\frac{7}{8}$ of the people of Paisley, the $\frac{1}{8}$ should have had only 39 cases instead of 502, which they *did* have, apparently from using hard water alone.

"All large consumers of water find hardness to be a nuisance in many trades, especially to those using steam, the reason being that hard water is largely contaminated with carbonates and sulphates, the former held in solution by carbonic acid, the latter by the water itself. When the water is vaporized the CO_2 is driven off by the heat, and the water at once becomes turbid by the separation and deposition of the carbonates, which settle as 'scale' on the boiler and flues. As soon as the water becomes somewhat concentrated by continuous vaporization, the sulphates begin to add to the deposit by slowly separating out and falling to the

lowest part of the boiler. These compound deposits, known to all housewives as 'fur in the tea-kettle,' and to engineers as scale, are not only a source of expense, from being non-conductors of heat, but at times prove dangerous, from suddenly cracking and allowing the water to come into contact with red-hot metal, resulting in a rapid evolution of steam, or sometimes in an explosion. In many parts of the country this fact compels steam users to employ apparatus specially constructed to purify the water prior to using it in the boiler.

"All trades using much soap are also sensibly inconvenienced by calcareous water, as not only must about twice the usual amount of soap be used, but a considerable quantity of soda in addition, to soften the water. The cost of *hard* water to London, in excess of what *soft* water would cost, is well shown as follows:—

"London uses about 1000 tons of soap per month—that is, 12,000 tons per annum—worth, roughly, about \$250 a ton; that is \$3,000,000 per annum paid for soap only. Now, half of this soap is wasted, for it would not be used if the water was soft—say \$1,500,000 wasted on soap every year!

"It is estimated that 250 tons of bicarbonate of soda are used per month, in London, for softening the water; this, at \$60 per ton, is \$15,000 per month, and \$180,000 per year; adding cost of soap and soda, we have *one million, six hundred and eighty thousand dollars* wasted per year, only as payment for the folly of using hard water. Let us now compare a few figures, showing analyses of different waters. London (bad river water), Rhine, at Bäle (good river water), hard well (Trafalgar Square, London):—

GOOD CITY WATER.

(GLASGOW, LOCH KATRINE, CROTON, N. Y., AND RIDGEWOOD,
BROOKLYN.)

Minerals.	Thames.	Rhine.	Hard Well.	Glasgow.	New York.	Brooklyn.
Lime	83.8	55.5	18.8	1.9	Av. 3 mo. 1868.	Av. 3 mo. 1868.
Magnesia..	4.7	4.8	9.1	0.8	Inorganic Matter. 96	Inorganic Matter. 64.4
Soda.....	9.2	0.6	265.3	—		
Potash.....	4.2	—	99.0	—		
Carbonic Acid.....	119.9	86.2	197.0	1.7		
Sulphuric Acid.....	31.4	15.4	180.5	5.6		
Nitric Acid.	—	—	—	—	Vegetable only. 11.4	11.8
Organic Matter...	49.7	3.3	13.0	—		

"The figures are parts per million, by weight.

"Five minutes occupied in studying this table will be well spent, as the figures are from the highest authority, and guaranteed correct; any one unfamiliar with the subject, may get a better idea of what makes water good or bad by looking over the table than reading a large book.

"The article in the paper which I have criticised has been very properly strenuous, as regards *organic* contamination, which, beyond all question, is the most dangerous of all impurity.

"Too much stress cannot be laid on this point, as many valuable lives have been lost to the world through this insidious poison.

"Organic materials find their way into water from various sources, any decomposing animal or vegetable substances being a convenient point of origin, such as

dead bodies of animals, or drainage from cemeteries, leakage of sewage or sewer gas, soakage into wells or water courses from heavily manured fields, barn-yards, pig-styes, or *any other* focus of decomposition.

"A few examples will illustrate this fact. During the two cholera epidemics of London, it was found that two water companies, the '*Lambeth*' and the '*Southwark*,' had laid their mains side by side through many streets, thus supplying water to the same neighborhoods all over London.

"Some people took of one company, some of the other, to the amount of 500,000 individuals, who were as evenly as possible divided among the two companies, being in the same condition elsewhere, as regards cleanliness, social status and respectability. It was discovered, however, that those supplied by the '*Lambeth*' company died at the rate of 37 per 10,000, while the '*Southwark*' people died at the rate of 130 per 10,000. It was at once suspected that the different mortality was probably influenced by some difference in the nature of the waters, and on examination it was discovered that while the '*Lambeth*' company went *high up* the Thames for its supply, far above city sewage or tidal contamination, the '*Southwark*' pumped its water at Chelsea, a point near large sewers and seriously affected by tidal changes.

"The river at Calcutta is intolerably foul, being contaminated not only by many thousand dead animals cast yearly into its stream, but also with 15,000 human corpses every year. Besides all this, the contiguous population add their quota in the shape of some *forty tons daily* of various excreta!

"Calcutta is now (since five or six years) tolerably well supplied by filtered water, taken out some 15 miles up the river by pipes and reservoirs, but, even when the city is healthy, a very severe type of sporadic cholera and dysentery is seen to prevail on board ships lying in the Hooghly, due simply to the fact that the water used is drawn up the ship's side in a bucket, and, of course, foul with organic detritus.

"The facts are almost identically the same at the port of Shanghai.

"In the year 1859 severe enteric fever prevailed at Bristol, England, and was easily traced to contamination of the wells by sewage and soil soakage.

"This is the curse of many a lovely country town where the farmers have such a fatal fondness for grouping barn-yards, pig-styes, and all sorts of unmentionable nuisances in as close proximity to the *house and well as possible!* The result is, that in this country typhoid fever is *far more a rural* than an *urban* disease, especially in New England. This is the reason why I object to admitting that good water is 'much easier had in the country than the city,' for, as things are, I would much rather drink an *unknown city* water than an unknown specimen from the *country*.

"These enteric fevers betray some curious facts. For example, in October, 1847, the inmates of 13 houses, scattered in various parts of a short street in Clifton, England, suddenly went down with typhoid, and no cause was suspected until it was *accidentally found* that these 13 houses were supplied with water from one well; the other 21 houses, *all well*, took water elsewhere.

"The suspected well was analyzed, and found foul

with sewage; the water supply was changed, and most of the sick recovered.—*Lancet*, 1859, p. 432.

"Milk, *watered* from a foul well, has *repeatedly* been known to produce epidemics of enteric fever.

"In Holland, during the first ten years of the century, the English expeditions suffered great loss from the so-called '*Walcheren fever*.' The country was a vast, stinking mud-bank at low tide, and the forces on shore died by *hundreds*, while the men-of-war lying in the river and exposed to all the foul *air*, carried their crews in high health! Why? The ships had water-casks filled in England; the land troops had to drink the marsh water, and died rapidly.—Davis on '*Walcheren Fever*,' 1810, p. 15.

"There is no reason why, in a *civilized* country, safe drinking-water cannot be found for human beings; the fact that so many risks are run is only another example of the old adage, '*Populus vult decipere*.'

"The public never wakes up to any great sanitary or moral purpose until either life or property is overwhelmed by some cataclysm. When people are *compelled* to understand the necessity of hygiene by epidemics of the enteric fevers, diphtheria, croup, scarlatina, small-pox, etc., there will be found no difficulty in providing a remedy.

"Until the 'good time comes,' let us try to formulate our knowledge as follows:—

"1. No water unfit for *washing in* is fit to *drink*.

"2. All *soft* water possessing a visible color, taste or odor is *probably* unsafe, but can be made potable by bringing it up to 100° C. (212° F.) and keeping it there for five minutes.

"3. Rain water is the easiest accessible source of soft water; when caught in a proper cistern, from a clean roof, especially during the last half of a long rain, when both air and roof have been washed clean, it makes a very clear and sparkling water, and is always better after filtering through charcoal, being then *healthful*.

"4. Hard waters are apt to act as a cathartic on those used to pure water, because they are generally dilute saline sol., such as we use for that purpose medicinally.

"5. Organic impurity is often the source of very fatal epidemics, and is by many believed to be one of the great sources of contagion in typhoid fever and cholera.

"Remember, that three-tenth grains of organic matter per gallon ($\frac{1}{2000}$ of one per cent.) has been known to do harm.

"A tolerably accurate test, and useful if organic matter is suspected, is as follows:—

"Sol. A.—Take 200 ccm. water, add two or three drops hydrogen sulphate.

"Sol. B.—Prepare a solution of permanganate of potassium, of the strength of thirty-two centigrams per litre of distilled water. Thoroughly mix *three* drops of Sol. B. in Sol. A and note time. If Sol. A is *bleached* in *less* than *ten minutes*, organic matter is probably present in sufficient quantity to do harm."

I will quote some very sensible advice, plainly worded, which, in a recent issue, the *Times* furnished to its readers: "Two leading ideas should be constantly borne in mind by every human being who sits down to a meal. The first is that most people nullify the benefit of their meals by eating too rapidly. The other is

that the neglect to be cheerful while eating is a common cause of dyspeptic wretchedness.

"The haste with which the American business man devours his food has become proverbial the world over. To see the average eater at his mid-day lunch, is to be struck with the idea that the poor fellow is devouring his last meal, and that he has but a few moments before being led out to execution. It is not only that the man is too hasty for his own personal good, but by his example he communicates the bad habit to his family at home, as he sits at meat with them. They all acquire the custom of bolting their food in such a manner as to secure the least advantage from it, and the greatest amount of physical discomfort.

"Even worse than eating rapidly is the habit of partaking of meals in a lonely and cheerless manner. Man was not made to be a hermit. The wretch who lives in a cell, on prison fare, may derive nourishment from what he eats, and may even grow corpulent; but meals eaten as he has to eat them become marvels of misery. To have to sit down with gloomy and severe people, even at a well spread table, is quite as bad as to eat in the confinement of a jail. The appetite, which should be the spice of the meal, is chilled by the cheerless, and the digestion which should follow it is a failure.

"The brightest hope for the eater is when the sunlight makes the room brilliant, when cheery chat makes those who surround the table to sparkle with good humor, and when the hearty laugh shows that good fellowship is at its height. For long life and prosperity, let us banish from our tables all that is disagreeable, sour, vixenish, and gloomy. Let us eat our meals

in as deliberate leisure as possible, and with a view to getting the greatest enjoyment and benefit from it," because, in conclusion, "to eat well is to nourish, to nourish is to make good blood, and good blood makes good cheer, and good cheer good friends, and good friends make happiness. Therefore, to eat well makes happiness."

CHAPTER IX.

HOW TO EXERCISE.

You all know that you ought to exercise; you do a great deal of talking about it, advise others to take exercise, and fail, in the majority of cases, to do so yourselves. Very few persons realize what true exercise means, and what purpose is to be accomplished by it. Those who stop to consider the subject at all seem to imagine that, when taking exercise, it is necessary for them to perform the most violent exertion, to strain and stretch all parts of the body and to keep up this motion until they are literally exhausted and absolutely unable to do any more.

This idea is not only erroneous, but it is injurious, and if persevered in will be productive of much harm. Exercise really means, when viewed from a rational standpoint, only a slight, gentle and gradual movement of every portion of the human body. Violent movements cease to be exercise and become injurious.

The grand fundamental rule holds good in the question of exercise, as in all the other duties of life, that excess can only be condemned. We must ever realize this fact. When once brought into the world, through the agency of our parents, and reared to that period when we become independent beings, it is the easiest thing imaginable to shorten our lives and to die young; while it is an exceedingly difficult thing, when viewed from the standpoint of ordinary humanity, to attain old

age; that is to say, the natural tendencies of human nature lean more toward those actions and that mode of life that will tend to shorten existence, than in the direction of those calculated to prolong it.

It will be well, therefore, at the outset, to understand what exercise really means, when we can go on to consider how to use it.

In nearly every portion of the body we find muscular tissue. This tissue is what you are used to call *flesh*. It is the material you see before you when a roast of beef is placed on the table. The skin has been removed, the fat is seen covering the roast, while the meat itself is seen as an apparently solid, stringy, fibrous mass of flesh. This is the muscle of the animal. If you were to kill a calf the day it was born, you would find precisely the same muscles that would be found in a cow six years old. But they would be small and very delicate; it would be an easy thing to chew them into pulp; hence, *veal* is considered very tender and very delicate.

The young baby (as the young calf) has exactly the same muscles that its father and mother have, but they are extremely delicate and tender. They could be easily torn apart. As the calf grows older its muscles become stronger; the very act of walking about, looking for grass to eat tends to strengthen these muscles. But just here comes in an analogy, worthy of note. A strong man is often described as, "as powerful as an ox." Did it ever occur to you that an "ox" does not frequent gymnasiums, neither does he row, or swim, or enter walking matches; lions, tigers, elephants and the like are considered prodigies of



OUR MUSCULAR MECHANISM.

Above is a dissected view of the principal muscles of the human body. On the left half of the trunk, the muscles which lie next upon the bones are shown. On the right half the superficial ones are shown. In the head, neck, and limbs, no muscles are removed. The narrow white cords connected with the muscles are the tendons.

strength; but they never resort to any artificial means to develop this much admired strength. This easy and natural acquisition of vigor and power suggests a lesson that I will teach you further on. Now, this same muscular tissue exists in many of the vital organs of the body. It is found in the heart, the intestines or bowels, the stomach, and so on. All the mechanical performances of life are executed through its agency. When you lift your arm or leg, you do so by the contraction of a muscle or muscles. When your bowels evacuate their contents, they do so by the contraction of the muscular tissue in their coats or in the walls of the tubes. By far the larger portion of the body of man is made up of muscular tissue. Each and every motion of any particular muscle has a tendency to toughen this particular muscle, to render it harder, more consistent and stronger. So, then, briefly, you can understand the purposes of exercise; you know that it has the effect of hardening and rendering tougher, and consequently capable of longer life, any muscle that may be so exercised, or kept in motion; because *exercise* really means *motion*.

It will now be well for you to understand that there are two classes of muscles in the body. What we call the *voluntary* and the *involuntary*. The first include all muscles that are under the direct control of the will. Thus, whenever you perform any *voluntary motion* (except thought) it is done through the agency of a voluntary muscle. When you raise a leg in walking, or an arm in striking, or you move your fingers in writing, such motion is voluntary; you wish it to be done, it is under the control of your will, hence such movements are

performed by the action of voluntary muscles. Anything requiring motion for its accomplishment, and needing your will to direct it, is a voluntary act, and must always be performed by voluntary muscles.

Under the second class, we have such muscles as act independently of the will, and are not influenced by it. The most perfect illustration of this class is the heart. From the day of birth until the hour of death, this muscle contracts, relaxes and contracts again, day after day, some sixty or seventy times every minute of life, sending the vital fluid throughout the body, while it is absolutely independent of the *will*. No man can by any voluntary effort cause his heart to beat faster or slower. It is true, that certain *emotions*, such as fear, shame, anger, and the like, will cause an unnatural depression or exaltation of its action, but, when so irregularly acting, let any man try to control it, and he will soon understand that his heart is not under the control of his will. Take a bashful man, for example, and let any one say, in his presence, some words of flattery; his heart will commence to thump against the chest walls, his cheeks will become crimson, his head will throb, and to save his life he could not control his heart's tumultuous action. This clearly indicates that the heart is not under the control of the will, and is plainly an *involuntary* muscle. The muscles in the coats or lining of the bowel are the same. A constipated man can realize this, when he remembers how frequently he has *voluntarily strained, and strained*, without being able to have a passage. This muscular coat, or these muscular fibres, are not under the control of the will, and cannot be made to contract

directly by it. So also with the blood vessels; they contain muscular tissue, the contraction of which enables them to force the blood throughout the body. The heart alone could not overcome the resistance offered by the pressure of the various parts of the body to the passage of the blood through the blood vessels, so that the auxiliary aid of the muscular contraction in the walls of the vessels is necessary. These muscles are involuntary; no one could possibly, *by his own will*, force the blood more rapidly, or less so, than it may happen to be moving. So, then, you can understand the difference between voluntary and involuntary muscles. The first are those that act only under the direction of your will; the second are those over which you have no voluntary control whatsoever. The same rule holds good for both classes: *motion* is necessary for their healthy existence, *but too much motion, and too violent motion* is injurious to both.

No physician can tell you the *intimate why* certain physiological or diseased phenomena occur, but they can tell you positively, as a result of extended research, observation and experience, that they do occur.

So, then, while we can tell you roughly and explain to a certain point, that a sufficiency of exercise is necessary, and an excess of it injurious, we cannot penetrate the hidden mysteries, and demonstrate *exactly* why these facts are facts. But we can say, and say it positively, that exercise is necessary to the physical and mental welfare of the human being; that without it long life will be impossible.

I will now divide *exercise* into two parts, and consider them separately: I, Physical; II, Mental.

PHYSICAL EXERCISE.

By physical exercise, I mean the use or motion of the muscular portion of mankind. Grossly, it might be defined "*motion of the muscles*," but this definition requires distillation and refinement. As I said in the beginning, the majority of persons seem to consider that if they exercise until they experience great fatigue, they have accomplished this purpose. Here they make a grievous error. *Fatigue* evinces an exhaustion, an overtaking of the vital power, and is injurious. It may *seem* to the ardent athlete that excessive use and exercise of his muscles is beneficial, but this *seeming* is only an illusion, and is not a fact. To believe this, you have only to recall the numberless instances among your acquaintances where men, for a time remarkable for their brute strength, have suddenly succumbed and died young, or dragged out a miserable existence of ill health, ultimately dying sooner than they ought to have done. Witness the recent case of the famous English pedestrian, who, after winning several walking matches and exhibiting wonderful evidences of endurance, finally has given up when only twenty-eight years old, and will most probably be a confirmed invalid for the rest of his life. Many men have ruined themselves by excessive rowing, swimming or walking, and I will tell you why. When a muscle is exercised or used, a portion of its constituents are consumed. As I have already told you, every act of life entails, as the result of its performance, the destruction of its former composition; its elements become disintegrated; they are chemically changed, and this change gives rise to the force necessary to perform the action.

But when these particles are used up, it is necessary for new ones to take their place, else the body will suffer for the want of them. These new particles are derived from the blood; the blood comes from the heart. Now, then, if these particles of tissue are consumed abnormally fast, their places must be supplied abnormally quickly; hence an undue, unnatural and unjust demand is made upon the heart to supply them. It endeavors to fulfill this demand, and in doing so is overtaxed; it works hard, and consequently becomes exhausted, when disease of this organ ensues. Thus, then, you can understand that *excessive* exercise of any kind is very apt to produce heart disease.

A man can develop his external or visible muscular system to a wonderful degree; he can become a perfect Hercules; he can be the admiration of his friends; he can perform the most marvelous feats of strength, and yet, when such excessive external development takes place, it is usually at the expense of the internal vital organs. The longest lived men have not been noted for their great muscular strength. Indeed, it has often been almost the reverse. We frequently find long and healthy life in comparatively weakly external cases or bodies. This is because, as I have already said, *excessive* development of any one part must necessarily take place at the expense of some other portion. But, in order that the longest, healthiest and most pleasant life may be lived, every part of the human body must in turn be developed and exercised, easily, quietly, moderately and sufficiently. Just as *excessive* mental development is usually accomplished at the expense of physical strength and vice versa, so

excessive development of any one part, or any particular set of muscles, must take place at the expense of all other parts.

Now that you understand what exercise means, that *exercise* and *motion* are synonymous terms, I will proceed to point out how this exercise can be obtained, so that it will prove beneficial and will not be productive of injury. When, during the stormy days of winter, it becomes impossible for the wealthy man to drive his spirited horses, he is obliged to let them stand week after week in the stable; but realizing that this inactivity will be injurious to them, he directs the coachman to daily take them out for a few minutes, and quietly walk them up and down the neighboring streets. He is too sensible to harness them up to a carriage, and drive them as fast as they can go for many miles, stopping only when the horses are out of wind and utterly unable to run any further. He knows that this violent work would be calculated to strain the heart and other vital organs, and ruin his valuable horses for life. But when this same rich man's son becomes a young man, he encourages him to frequent gymnasiums, places where I am sure more young men have been physically ruined than have been benefited. There are two reasons for this, and I must clearly explain my reasons for making a statement so at variance with the generally accepted ideas of mankind. In the first place, *nearly* all the methods of exercise in common use in gymnasiums are too violent; they require too much expenditure of force, too much effort for their accomplishment. Look at a young man who has for a few minutes been exercising on parallel or horizontal bars; stand before him,

and, what will you see? A flushed face, panting from shortness of breath, he is hardly able to speak for a few minutes. Place your hand over his heart; it is striking with sledge-hammer force against the walls of the chest, and is acting unnaturally and unnecessarily rapid; that is, unnecessarily so to maintain health, though this rapid action is essential to the condition in which he then is. After a few minutes, and before the heart has thoroughly regained its normal condition, he goes off to the horse, and vaults over and over again, until he has again brought his whole body into that unnatural condition of strain already noted. Then to something else, and so on, until finally he becomes so tired and exhausted that he is incapable of any further exertion; then, and not till then, does he desist.

This mode of exercise would be similar in its final results to those ensuing upon repeated violent and prolonged driving of horses. It would develop the external muscles, making the young man lithe, strong and graceful in his movements, but the delicate internal organs would suffer.

Secondly, by the indiscriminate mixing of boys and young men of full ages, that must necessarily occur in public gymnasiums, an additional danger is created, namely, *emulation*, or example. When a small boy sees a larger one vault over a horizontal bar, five feet from the ground, his pride is stirred, and he will not be satisfied until he has accomplished the same feat. So he tries and tries, and strains and strains. It becomes his ambition to lift and exercise with as heavy a dumb-bell as some friend several years older is able to handle, and here again he overstrains himself.

These two examples will serve to illustrate the point I desire to make. Young America is too go-ahead, too independent, proud and ambitious to allow any one else to do more than he can do, if it is at all within the bounds of possibility to accomplish the same.

A few words about the formation and function of the heart will make clear to you how easily this strain on it can produce serious derangement. The heart is really a pump, a muscular pump, about the size of your fist. It might be compared to the rubber-bulb on the tube of an ordinary Davidson's Syringe, with which nearly every one is familiar. It is the duty of the heart to force the blood throughout the body. When you compress the bulb of the syringe, having previously dipped the lower end of the tube into the liquid, and then remove the pressure of your hand, the bulb expands, and doing so, draws the liquid into the bulb, through the tube. When you again compress the bulb, the liquid does not, as would be supposed, flow out of the lower tube into the basin again, but being forced against gravity, ascends the upper tube and is injected out of the upper opening. It fails to flow downward for one simple reason, because it cannot. Just at the junction of the lower tube with the bulb is arranged a little movable valve; when the liquid is drawn up, this valve is displaced upward and allows the liquid to enter, but when the bulb is again compressed, it is forced down into the opening, thus preventing the regurgitation of the fluid and compelling it to flow upward against gravity. If you were to place the lower opening of the syringe in a bucket of water, and alternately compress and allow to expand again the bulb,

doing this some seventy or eighty times a minute, you would have a very good representation of the heart's action. The heart is divided into four cavities, in each one of which the blood for a time resides. When it flows from one into another, it passes through an opening provided with a valve, and when the heart contracts to cause this flow, these valves shut down, each against its own particular opening, and thus preventing regurgitation, keep the blood where it naturally belongs and cause it to flow in proper channels. If you compress the bulb of the syringe, gently and equably, it will last a long time. But if you use it roughly, compressing it violently and irregularly, forcing the valve harshly against the walls of the opening, you may by such rough friction wear it gradually away, until it becomes too small to thoroughly protect the opening, when the liquid will regurgitate into the lower tube, and the syringe is faulty.

The valves of the heart are infinitely more delicate than that of the syringe, and much more easily deranged. They are composed of thin tissue, hardly thicker than tissue-paper, and are held in position by thin and delicate cords, like fine cotton thread. Were it not for these cords the free ends of the valves (to which they are attached) would be carried back into the openings at each contraction of the heart, and would not be able to offer any impediment to the regurgitation of the blood.

The valves become disordered and incapacitated in many ways, from disease, but with these deranged conditions we have nothing to do, since our subject will treat only of mechanical disturbances, such as are pro-

duced by strain from excessive exercise. By *violent* contraction or compression of the syringe-bulb the subsequent dilatation will be correspondingly great, and rubber being elastic, the bulb, by repeated abuse, will become abnormally distended. The heart is likewise elastic, and can become distended. If it is forced to repeatedly contract excessively, to furnish an excessive amount of blood to repair excessive waste or consumption of tissue, due to excessive exercise, it will ultimately become distended. The various orifices through which the blood passes from one cavity of the heart to another and finally leaves it to enter the blood vessels, are, of course, much smaller than the cavities themselves. Therefore, when this organ contracts, you understand that it will force against these openings more blood than can pass through them; so that at all times more or less strain or pressure is thrown on these openings; but when the heart is only acting with its natural force this pressure is not sufficient to exert a hurtful influence; the walls of the openings and the valves are sufficiently strong and possess a sufficiency of resisting power to adequately oppose this pressure.

When, however, the heart is acting and contracting unnaturally rapidly and with abnormal force, the case is different. The column of blood, thrown with great force and violence against these valves, may strike their surface with such vigor as to tear or break some of the cords that hold them in position, when, as I have already demonstrated, their free ends, no longer under the control of these cords, will be carried by the current of blood back into the openings, and regurgitation will occur. This is a comparatively rare accident. The

most frequent disastrous results of excessive action of the heart occur as follows: The blood thrown, with the unnatural force described, against these openings, after being frequently repeated, finally commences to gradually dilate and expand these elastic openings. As a result the valves are too small to thoroughly protect these abnormally large openings. Thus, when the heart contracts, and the valves take their position, a crevice is left, through which the blood regurgitates.

Again, an accident which, though very rare, is possible and does occasionally occur, deserves notice, since it proves immediately and invariably fatal. A heart weakened by some disease, and distended by excessive action, may on some suddenly great exertion give way or rupture (just as a rotten hose will do under a great water pressure); the blood will pour out into the cavity of the chest and the victim will die in a very short time. Two of these accidents are very infrequent, while the third is of very common occurrence. It would require a pathological dissertation that would be tiresome and unintelligible, to explain to you why this regurgitation of blood will be injurious. It will suffice to say that there is a place in this world for everything. The merchant has certain places in which to keep his books and papers; the farmer for his tools, utensils and machinery; and the housekeeper for her brushes, brooms and dust rags. If these various articles are not kept in the places designated for them, confusion and trouble ensue. So it is with the human body; there is a place for and an order of things, that are absolutely essential to healthy life; while any deviation from these natural laws is sure to be followed sooner

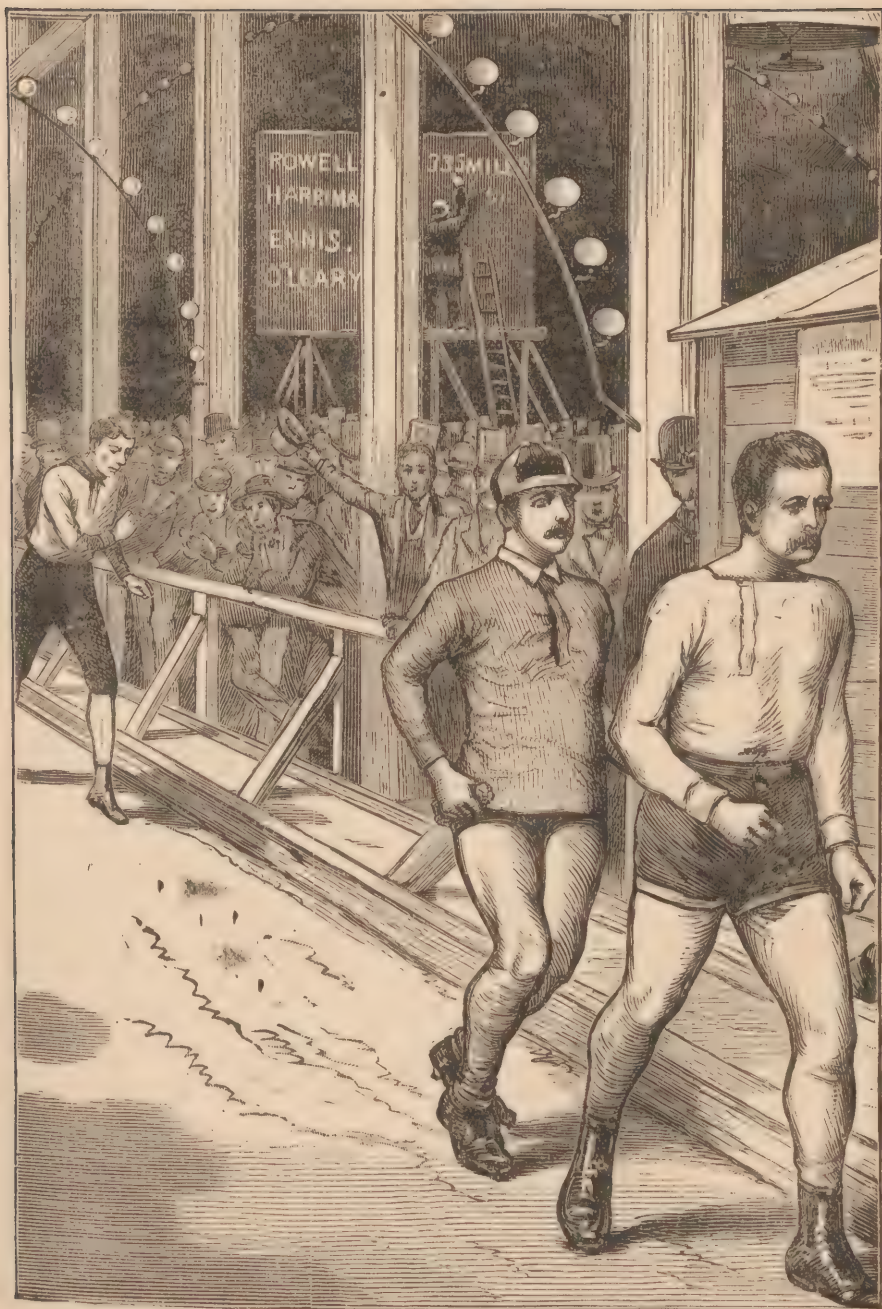
or later by disease. If the accurate adaptation of these valves and the prevention of regurgitation were not necessary to healthy life, they would not be so accurately fitted. While there are many of the more intimate phenomena of life that we cannot penetrate, yet we do know that every portion of the human body has been designed with a wonderfully wise purpose, and that nothing exists unnecessarily. By this regurgitation, the column of blood coming to the heart from all portions of the body, will be pressed upon. If the valve in the syringe acts imperfectly, the column of water pressing backward will interfere with the suction of that in the basin. So the blood, pressing back on that endeavoring to reach the heart, in the vessels running to that organ, will interfere with its free passage, will dam it up, as it were. These blood vessels pass through the different vital organs of the body, carrying nourishment to them and removing their dead tissue. If, then, the blood is caused to remain abnormally long in them, this stagnation will take place within the substance of some of the vital organs, since all the blood vessels of the body communicate one with another, and a congestion of such organ or part will be the consequence, thus predisposing it to disease.

I have used the heart to illustrate the dangers of excessive exercise, because this organ, as you can now understand, from what I have told you of its formation and duties, is the one most apt to be influenced by this indiscretion, while it is the important centre of life, upon the integrity of which so greatly depends the proper performance of duty on the part of all the other organs.

Besides gymnasiums, there are other forms of physical exercise that come under this same category of excess : Rowing, swimming, riding, walking, all can be carried to injurious excess ; but some are much more liable to be abused than others. Thus, rowing, in a certain form, cannot be too much condemned, while, when judiciously resorted to, it constitutes one of the most commendable and healthful of exercises. We will now consider the different forms of exercise most commonly resorted to, and point out how each may be made beneficial or injurious ; premising, however, as you will now be ready to believe, that the habit of frequenting gymnasiums for exercise is so very apt to be injurious, that it is worthy of a *general* condemnation.

Walking.—Par excellence, walking is the *exercise* for a healthy man. When a man walks, he is exercising nearly every muscle and portion of his body. It is not considered graceful to swing the arms when walking, but grace and fashion must quail and give way before the dictates and laws of health, and a man *ought* to swing his arms as much as nature dictates would indicate, since by so doing he will exercise them. If he does do this, stop and reflect a moment what takes place. His legs and all the muscles connected with them are in motion ; his arms and adjacent parts are receiving the same motion. When walking, place your hand on any portion of the body, and you will be surprised to find that there is motion in such part, and you will be gratified to learn that such motion means exercise. Those portions of the body that you would least imagine are in reality in motion when you are walking. In addition to the exercise of the external and voluntary muscles,

all the internal parts are kept in motion and are exercised. The *pedometer* (an instrument to measure the distance walked) is based on this fact. Every time you put your foot on the ground, every portion of the body is *healthily* jarred, every organ and part is slightly concussed; it is *shaken up*, as it were, and its health increased, and its life lengthened. From the sole of the foot to the very hair of the head, every particle is kept in *motion*, and is consequently exercised. The *pedometer*, an instrument with works similar to a watch, is loosely hung from the upper part of the vest pocket; as the body jars at each step, a lever is forced up and down, which gives motion to the works; each step is registered, and a hand on a figured dial registers the number of miles walked. This delicate instrument does more than merely record for satisfaction the distance covered; it proves conclusively the concussion or shaking or moving of the body in walking, and speaks louder than words in favor of pedestrianism as an exercise. But walking can be abused; like every other good thing in this world, *too much* of it is worse than none at all. For the same reasons that gymnasiums are injurious to the integrity of the heart, so walking will be, if injudiciously carried out. If you walk exceedingly fast, you use up muscular tissue unnaturally quickly, and the heart is called upon to supply the demand in an abnormally short time. Therefore, over-exertion on the part of this organ will be apt to produce the diseased conditions already noted. You can know that you are walking too fast, when you become very short of breath. There is not near so much danger of walking *too far* as there is of walking *too fast*. Fa-



PEDESTRIAN CONTEST AT GILMORE'S GARDEN, NEW YORK CITY.

tigue, *gradually* coming, will warn you when you have walked far enough, and you will rest ; besides, the demand made upon the heart from this cause will be of a totally different nature. The demand will be great and unnecessary, it is true, but it will be gradual, and not in the nature of a strain. The heart may become *tired* from this extra work, but it will not be *strained*, since no sudden, extraordinary demand has been made upon it. It may be required to furnish more nourishment, but the request will be gentle and easy, and will produce only a fatigue from which subsequent rest will enable the heart to thoroughly recuperate. A continuous walk of twenty miles in six or seven hours will be much less injurious than five miles walked in one hour. You can realize and demonstrate the truth of this statement if you desire. Start out some time and walk five or six miles as *fast as you can*. In a short time you will find you are getting short of breath ; your heart will commence to beat very rapidly, your head to throb, your body to feel warm, and when you are through you will be almost gasping for breath, while your heart will be beating so rapidly and forcibly as to be plainly felt against the chest wall. This excessive action will entail the same dangers that the gymnasium will. Here, again, you will note what I have so frequently said, that *excess* is the dangerous factor and the enemy to health and long life. The merchant whose office is a mile or two from his house will derive a sufficiency of exercise by walking to and from his place of business. So will the lawyer. The farmer following his plow needs no other exercise, save that which I will presently describe for the evening.

Therefore, to sum up, walking is a splendid exercise for all parts of the body ; there is none better ; but, like everything else, it must be indulged in with judgment. Look at the clerks and salesmen ; those, I mean, who are anxious to live long and healthy lives, who are sensible. Confined to their offices nearly every day in the year, when a holiday comes (and they come too rarely in this country, they are too much like angels' visits) they make up a party for a long walk in the country, believing it to be the best and most sensible way in which they can spend the day. While it will be much more to their benefit than the other extreme to which so many young Americans resort, of passing all spare time in bar-rooms, yet it is not the best thing to do, for the reasons already given. They are not accustomed to this great muscular exertion, hence it becomes *excess*, and is injurious. So, then, there is such a thing as too much walking. In general terms, it may be said that four or five miles a day will be sufficient for the ordinary business man. It would be much better for young men to spend one-half their holidays in reading, and the other in gentle, easy, quiet walking, covering not more than four or five miles. Do not allow yourself to be tempted to excess by some companion who may happen to be more of a pedestrian than yourself, else you will regret it. When you feel tired, and are short of breath, sit down and rest. I remember once, when I lived in the country, meeting a gentleman at the station who inquired from me the location of a neighbor of mine ; I told him that I was going that way and would point out the house to him. I had frequently walked from the station to my house ;

in fact, ordinarily did so, and profited much in health from the exercise thereby derived; *but I always walked leisurely*. We started off, and I soon noticed that my new-made friend was walking very fast. Still, the air was bracing (it was in October), I felt good, and thought this brisk walk would be beneficial. Presently I became short of breath, walking up a steep hill; still I kept on; when I reached home (about a mile and a half from the station) I pointed out my friend's destination to him, and went home and passed the afternoon in bed; for, when I entered the house I was so weak, and my heart was beating so, that I could hardly stand. I learned a lesson from this experience, and as long as I retain my reason, no power can ever again induce me to walk *fast*, for any distance. You know the old saying, that "*a man once died in a hurry*;" I will alter it, to say "*that hurry has killed many men*."

So, then, *walk*, but walk leisurely, walk in the pure country air, and have pleasant company. Have some one with you who is congenial, who can talk as you walk, and discuss the many interesting and instructive themes suggested by the surrounding nature. Such walks will fill every interstice of your body with pure, vivifying air, and will give the necessary exercise to render this air potent to prolong life.

The importance of judicious walking as an exercise cannot be over-estimated. It would be well to arrange (as every one can do, if he will) to walk nearly the same distance every day. Nearly every man works at a certain distance from his home. By walking to and from his place of work, he can secure this exercise; while women ought to make it a religious duty to go out every day

for a walk. Women (in this country) are the ones who suffer most from this neglect of walking. They are truly hot-house plants. When the sun shines brightly, they put on their best clothes and walk on the principal city thoroughfare for a few squares, to *show off* their good clothing and to buy a *spool of cotton*, as an excuse; but if you were to suggest a three-mile walk in the country, they would consider it as much of an impossibility as the completion of a road to the moon. Is it any wonder that they suffer from backache? When a rainy spell sets in, they won't go out at all, because it is *so damp*; is it not rather a matter of wonder that they live at all. To any one who has traveled, the contrast is striking, between the ruddy-complexioned, (rough-skinned, it is true, but healthy) strong, hearty, vigorous, big feet women of England, who walk, and our sickly, pale, artificial, cramped feet and waists young women of America, who do not walk. Do, for heaven's sake, young girls, as you value your life and health, as you hope to bring forth strong children, come out of your holes, emerge from your green-house lives, live the natural and vigorous life of the aborigines and of your British sisterhood. Walk, for heaven's sake walk, exercise; go for two or three miles into the country, and your backache will vanish; your sallow complexion will become rosy, your appetite good; your sleep and dreams delicious and refreshing; your strength marvelous, to what it has been; your general appearance and physique comely, graceful and beautiful, one upon which young men will love to gaze. No matter if it is raining, put on your waterproof and overshoes and walk. I have known a few such young

ladies ; who were too noble-minded and too sensible to be afraid of such a little trifle as rain ; they realized that they were made neither of salt nor sugar, and would not be *melted* by water, but were composed of better and more solid material. If you knew these ladies as well as I do, you would be induced to follow their examples. They are not weak and sickly ; they do not complain of backaches and headaches. They are strong and vigorous. Their days are active and their nights refreshing. So then WALK, but walk with judgment. The two guides (infallible ones) are, stop when tired, and never walk fast enough to put you out of breath.

Riding.—It is a question which ought to take precedence, walking or horseback riding, they are both such excellent forms of exercise. In riding, the same jarring, the same motion of all parts of the body, is secured. It is a most admirable form of exercise. The muscles of the legs are brought into play in grasping the horse's sides ; the muscles of the arms in directing his movements ; the muscles of the trunk in sitting erect ; while the jarring from the motion of the horse is communicated to all the organs and exercises them. Could a more thorough exercise be invented ? Scarcely, unless we except walking. Therefore, we must place the two side by side, and recommend the use of both to those who can afford it.

You will remember that the Italian, CORNARO, was much given to riding, and it is truly an edifying and instructive sight in our city, to see the honorable and venerable Eli K. Price, who has sufficiently demonstrated, by his long and venerable life, that he under-

stood the true principles and realized the necessity and value of exercise, daily mounted on his handsome horse, with his long white hair flowing in the wind; his form still erect (though he counts more than EIGHTY-FOUR years of an unusually active and useful life), riding down our main thoroughfare. He realizes, in riding, the truth of what I have said about walking; he is never seen riding fast; the horse goes slowly along and so does his master. But the horse accomplishes the purpose and covers the distance that his owner desires. Often, when I have been sitting, writing, glancing up from my work, this venerable and well-known figure meets my eye, as he jogs slowly by on his horse; and it has more than once started me to moralizing. There, I think, goes a man who has throughout life known *how to live*, and has lived in accordance with this knowledge. Exceeding, by many years, the average duration of human life, he has done so, because he wanted to; because he early studied how to live and so lived. Yet he has enjoyed the rational pleasures of this life as thoroughly as any one; he has been and is a prominent man in social and political circles. He has attained a great age in health and happiness, and promises to live many more years. His patriarchal figure ought to set an example to all young men. They ought, when looking at him, to think, there goes a MAN; they ought to see in him embodied the greatest possibilities of which poor human nature is capable; they ought to recognize a grand old man, who has become so by living a correct life. His great age, white hairs, and erect form are not the result of accident or chance, but are the logical sequences of a wise life.

Therefore, I would advise all who can afford it to resort to horseback riding as an exercise, using here the same precautions that have been indicated for walking.

ROWING.—Rowing can be made one of the most beneficial and most pleasant of exercises, or it can be rendered very injurious. I would advise young men to avoid boat clubs. When they join such organizations, they constantly hear of races; their ambition is stirred, they desire to become members of the racing crew from their particular club, and since practice is necessary to make them sufficiently expert, they work and work. Finally the picked crew is chosen, the day of the race comes around, every one is anxious, and none more so than the members of the various crews. The race begins. Soon one of the men becomes exhausted, but he cannot stop, his *pride* (foolish sentiment) will not allow him to do so. He tugs away at the oar when he ought to be in bed; when the race is concluded, he leaves the boat a very sick man; he has overstrained himself and his heart has given way to the strain. In this way, when indulged in to excess, does rowing become injurious. If, now, a man will go out in a boat, and alone, or with a companion, paddle leisurely about, not making up his mind to reach any particular goal, but resting on his oars whenever he feels at all tired, he will do himself a positive good. Thus, then, the same general rule here holds good; excess is injurious, moderation is beneficial. Excess is to be determined in the same way as in the case of walking.

Driving.—There is comparatively little true exercise in driving, since the body is quiescent. Nevertheless, this is a form of amusement to be commended,

because it necessitates and insures a full supply of pure air. If driving yourself, a certain amount of exercise of the arms and hands and upper portion of the body is secured in handling the horse. While if some one else is driving, there is derived a certain amount of shaking up, of motion of the body, which will prove beneficial. Therefore, while not constituting true exercise, in the sense that the foregoing do, driving, nevertheless, is very beneficial and ought to be indulged in by all who can afford it.

Railroad Traveling.—This is a form of exercise never yet commented upon or recognized as such, and still it is a good and wholesome exercise. While, of course, it cannot hold rank with walking or riding, yet it is a very good stimulant to the human body. The rattle and jar of the railroad train rattles and jars the body. It is a *passive* exercise, it is true; that is to say, the muscles are not moved voluntarily, but they are moved all the same. Every one who has traveled for a day in steam cars has experienced a sense of great fatigue when leaving the car; he feels tired, nearly as much so as though he had walked all day. Were he to sit quietly in a chair or lie in bed for the same period, he might feel weak, from want of exercise, but he would not feel tired; therefore is it that he feels and is exhausted, because the constant shaking and motion which the body has received from the vibrating and oscillating cars has exercised it. To believe this, it will only be necessary for you to notice, the next time you travel, how strong and hearty all the officials of a railway train seem to be.

Sea Bathing.—Here we have a magnificent and yet a



ACTIVE WORK.



HEAVY WORK.

TWO STYLES OF SIMILAR EXERCISE.

seductively dangerous form of exercise. None can be better, none can be made worse. If any thoughtful person will reflect for a moment, they will realize what a tremendous effort, how much use, exercise and motion, how much force, must be consumed in withstanding the terrific onforce of the mighty waves. Stand for one moment before an incoming breaker, and relax all your muscles, make yourself as inanimate as possible, offer no resistance to its mighty power. It will toss you around and play with you as it would with a match or a shaving. Thus, then, you can to a certain extent realize how much strength, how much exercise of the various muscles, would be required merely to stand up against these powerful breakers. But when you attempt to meet them at their own game, to dive into, float over and in various ways disport with them, the expenditure of force becomes enormous. It is a magnificent exercise, but there is scarcely any other form that so taxes the animal strength. Remember, also, that in addition to this exhaustion of strength, the cold water (colder always than the body) is continually removing some of the vital heat, the reproduction of which from within is an additional strain on the vital force. Therefore, it can be enunciated as a general rule, that while ten or fifteen minutes' wrestling with "*Old Neptune*" at the seashore will constitute good healthy exercise, a longer period in the ocean will produce exhaustion, and will be injurious.

Having now discussed the principal forms of exercise ordinarily indulged in, it will be well to consider and demonstrate to you the truest and best

methods of physical exercise, such as can be enjoyed by all, whether rich or poor.

GENERAL EXERCISE.

Remembering that exercise means nothing more than *motion*, you will be able to understand the utility of the methods I am now about to enunciate. They consist simply in gentle, easy movements of all parts of the body. When retiring at night, and upon rising in the morning, when clothed only in undershirt and drawers, so that your movements may be free and not hampered as they would be if you were fully dressed, will be the time to indulge in these exercises. Now, then, when you are all ready, go through the following performances some twenty, thirty to fifty times each:

1. Extend the two arms laterally from the body, and elevate them until the hands come together above the head; then bring them back to their original position and repeat.
2. Extend the arms laterally from the body, and elevate them one-half as high as in No. 1. Then flex the forearm on the arm, making a fist of your hand as you do so; then extend the forearm, opening the fist as you do so.
3. Bringing your hands together behind, in the region of your loins, throw your shoulders back and your chest out, and so remain for a minute or so.
4. Letting the arms hang in their normal position, rotate them, *i. e.*, so twist them that at one time the palm and again the back of the hand will be in front.
5. With the arms in the same position, alternately elevate and depress your shoulders.
6. Standing erect, rotate the head from side to side.
7. Bow the head several times.
8. Standing erect, with the arms elevated above the head, bend forward until your

hands touch the floor, and rise again to your former position. 9. Standing erect, stoop down on your haunches, until you are nearly sitting on the floor, and rise and repeat. 10. Rotate the trunk from side to side, and bend it laterally. 11. Lie on the bed; elevate first one leg, then the other. 12. Move one leg laterally away from its fellow, then the other. 13. Rise to the sitting posture, recline and rise again, and so on.

This is not intended by any means to be a full table of movements. They are so very varied and so numerous that it would be tiresome to enumerate them all. These few principal ones will convey the principle, and my intelligent readers will soon be able to regulate a course for themselves. The idea is to gently twist, and turn, and move every portion of the body, from top to toe. Your common sense will teach you how to do this. If you please, you might hold in your hands a pair of *light wooden* dumb bells, or you might use *very* light Indian clubs. Heavy clubs and iron dumb bells are dangerous, because they will cause more or less strain. If you go through all the various movements that your ingenuity will suggest, some twenty to fifty times, you will find, when you are finished, that you are tired enough, without the necessity of still greater exhaustion from overcoming the resistance of a dead, inert mass of iron. There will be enough exercise in overcoming the natural resistance offered by the gravity of your limbs, and no artificial weight will be needed.

This is true exercise; there is no strain about these movements, and if persevered in throughout life, morning and evening, devoting about half an hour to it on

each occasion, it will insure good physical development, muscular activity, and healthy life; while it will not interfere with intellectual training, neither will it render possible the danger of diseased internal organs from strain, providing, of course, you follow these movements with judgment, and do not carry them to excess, using here the same guides as in walking. This book is intended mainly for the average individual, who is neither very rich nor very poor; therefore the advice it contains is such as can be followed by all. Were I writing for the very rich, there are other forms of what might be called passive exercise, that would be most admirable.

To one who could afford to follow the luxurious example of the ancient Romans, I would say, when you have finished your evening's movements, remove all your clothing and lie down. Have a well trained servant to anoint your body with the purest oil, rubbing, kneading and bending every muscle and joint in your body. After twenty to thirty minutes of such manipulation, take a tepid bath, and returning to the bed, let the servant, with a moderately coarse towel, rub the whole body until it glows and you experience a comfortable sensation of warmth throughout. Then, getting under the covers and composing yourself for the night, your delicious and refreshing sleep, with your delightful dreams (if you dream at all), will make the fairy tales of the Arabian Nights sink into insignificance.

FRANKLIN'S AIR BATH.

A most excellent thing, that ought to be indulged in by every one. When you rise in the morning, remove your night shirt and sit naked, for an hour, reading or

writing. The body of the average individual is very rarely exposed in its entirety to the action of the atmosphere, but it ought to be. Good air is a great purifier, it is a magnificent disinfectant. When you remove your night shirt in the morning, smell it. Unless you are even more than a marvel of cleanliness, or your sense of smell very defective, this garment will be very offensive; it becomes so because, during the night, the surface of your body has been constantly giving off dead tissue, some of which has accumulated on the shirt, while some of it still adheres to the body. Now, this air bath will purify and renovate the surface of the body. The movement of the atmosphere will carry off these decayed particles, and much pure air will be absorbed into the body through the skin. When you are ready to dress, you will put your clothing on a clean and invigorated body. Many of my aged friends, whose kindly information has so much assisted me in preparing this volume, have for years been in the daily habit of resorting to this air bath, and they extoll highly its virtues, attributing to it, in a great degree, their long lives.

So, then, to sum up our advice on physical exercise, we can do so in a few words. Motion of any kind, not carried to excess, constitutes good, healthy exercise; carried to excess, to exhaustion, it becomes injurious. Of all forms, walking, riding, night and morning movements, with Franklin's air bath, form a combination standing at the head of the list, and cannot be excelled.

MENTAL EXERCISE.

The baby is weak, its muscles are incapable of lifting any appreciable weight. As it grows older these mus-

cles, as the result of exercise, grow stronger, until finally the man of forty who has wisely exercised can lift almost marvelous weights, and is capable of astonishing feats of strength. To demonstrate that this increase of power is due directly to exercise, and would not be without it, I will give you an illustration. If you were to take a little boy of ten, and so bandage one of his arms that movement would be impossible, yet growth would not be interfered with, as if you were with muslin to bandage the arm to the side, when he became a man he would have no more power or strength in his arm than he had as a boy. Again, when any limb is paralyzed its motion is suspended. The will cannot cause it to move. Its nutrition goes on all the same, but on account of the absence of motion or exercise it wastes or withers away. So that exercise is necessary for the full development of any part.

This is equally true of the mental being. If you were to place an infant in some isolated situation, where, while it had plenty of food, it was denied all means of cultivating the mind, it would ever remain an intellectual child. I remember, when I was a resident physician, in our Almshouse, we had a woman of over fifty, who had been brought to the institution when only four years of age. During this period she was only once outside of the walls of the institution, and then only for half a mile. She was, in all her ways, like a girl of nine or ten. Her world was narrowed down to the inmates of the house. Her mind had been denied the opportunities for cultivation, it had never been exercised, and was very immature. She would

play with dolls, and her chosen companions were the children in the house. It was really a sad sight to see this gray-haired woman taking part in childish play with as much pleasure as those young enough to be her grandchildren. Yet there was no insanity or idiocy here; the mind was all present, but from want of exercise it had remained as it was in early life.

The mind must be kept in motion, just as the body, else it will not develop. Just as the muscular system can be developed in any particular part, by especially exercising such part, so can the mind. As the external muscular system can be developed so as to produce great brute strength, so any function of the mental organization can be cultivated to great exactness by constant use or exercise. Tea-tasters cultivate the sense of taste by repeated use of it, so that their services are in great demand in commercial circles. So with many other branches of business. These special senses are really referable to the intellectual side of man, since *sense* is really intangible and immaterial, and therefore belongs to the mental attributes.

By constant effort in that direction, memory can be so cultivated that astounding development of this faculty will result.

The sense of smell, sight, hearing, all, indeed, are capable of development by exercise.

But here, as in the case of the physical being, the desideratum, the most perfect type of manhood, is to be developed from a judicious and divided development of all the mental faculties.

To accomplish this, every function of the mind must be kept in motion, as every muscle of the body is. A

man must cultivate his powers of observation; he must not walk through life like an automaton, looking neither to the right nor the left. He must notice all that goes on around him, and should reason and think about all the occurrences of life. His mental occupations should be varied, for monotony will ruin the mind. The life of a man who devotes himself to literary pursuits should be varied. He ought to read and write, to think, converse, and listen to others. Thus will he exercise all portions of his mind, and will be capable of performing a greater and more varied amount of work. The most perfect type of man results from a judicious exercise of both the mental and physical bodies.

Therefore, to attain this high standard, it will be necessary to practice the advice already given about physical exercise, and to combine the mental with it. Business men care very little about mental development, beyond that requisite for the successful prosecution of their business; but they ought to, for I can assure them that they would enjoy their wealth much more than they do, were they only to exercise and educate the mind. If instead of accumulating a library of *handsomely bound* volumes, merely for show, that they never use, they would read their books and reflect over their contents, their ideas would become enlarged, developed and refined. They would realize that there existed a world outside of their counting-rooms; they would become intimate with the great minds and sublime thoughts of other days, while they would regard the pleasures and duties of life from a less sordid standpoint.

This reading and subsequent thought would constitute mental exercise. The more a man read, the more he would like to read, the more he thought, the more capable would he be of thinking. Thus, then, unconsciously to himself, would his mental being expand, he would gradually become more truly a *man*, one to whom life would offer greater real pleasure, while he would be more capable of being of service to his fellow-men while he lived, and would leave a greater void when he died. Therefore, in conclusion, to sum up; exercise is of two kinds, mental and physical. It consists in motion, and this motion is acquired by *use*. Lazy men are short-lived, as a rule, while activity or exercise tends to prolong existence. Exercise of both portions of mankind is necessary, in order that a man become thoroughly developed and may live a long life, and this exercise is to be acquired by gently but *constantly using* every portion of the body.

CHAPTER X.

BATHING.

A few words on this subject will prove beneficial, since but few persons realize its importance.

The majority of human beings who can do so will occasionally take a bath, simply because the idea of being dirty is repulsive to them, and they feel, instinctively, that they ought to be clean. They do not know how important a factor bathing is in the maintenance of health and promotion of longevity. Its importance cannot be over-estimated.

There are scattered over the body millions of little sweat glands, as many as one hundred and eighty thousand in a single square inch of surface. They are all scavengers; their duty is to remove from the body the dead organic tissue I have told you about. They are constantly performing this work. The body is continually perspiring, though it may not feel moist to the touch. This we call *insensible perspiration*, because as rapidly as it exudes on the surface of the body it is absorbed and carried off by the surrounding atmosphere.

When you walk fast or perform any excessive exertion, even in cold weather, you perspire more freely, and this previously *insensible* becomes *apparent* transudation; because by this exertion you have consumed or changed an extra amount of tissue, and these glands must perform more work to assist in its removal. Per-

spiration performs another purpose. If you dip your finger into water and then blow on it, it will feel cool. This is because the breath, which is air, causes evaporation of the water, which tends to lessen the temperature of the part so treated and to make it cool. Perspiration does the same. This water on the surface of the body is evaporated by the atmosphere, and by this means any excess of heat generated in the system is carried off, and a uniform temperature is maintained.

This perspiration is composed of two elements, water and solids, the latter of which are the broken down organic elements, ready to undergo decomposition. The water is absorbed into the atmosphere, while the solids deposit on the surface of the body. After a while they accumulate and decompose, when you will smell bad. They will also mechanically block up the orifices of these glands, and prevent the free passage of subsequent perspiration, with its load of dead tissue, when this must either remain to poison the system, or will impose an undue amount of labor on the other excretory organs or scavengers, to remove it. In this way those delicate and important organs, the kidneys, may be overworked and become diseased. Dr. Wilson,* commenting on the necessity of cleanliness, says: "The flattened cells or scales of the scarf-skin are being constantly cast off, but are retained on the surface by contact with the clothing, and mingling, as they do, with the oily products of the sebaceous glands, they become glutinized, as it were, into a thin crust, which covers the whole of the body. This, if not periodically removed, attracts the floating dirt or dust

* *Healthy Life and Healthy Homes.*

which is ever present in the atmosphere, and the consequence is that the balance of healthy life is disturbed by obstruction of the pores of the skin, a larger share of work is thrown on other eliminating organs, the blood is liable to be imperfectly purified, and disorders, more especially of the skin itself, are apt to be induced."

I am sure that very few people ever stop to think of this. They wash, as they wear fashionably made clothing, because others do it. They have been taught from early infancy to do so, and as they grow up they keep on in this acquired habit. When their hands look dirty, they will occasionally wash them during the day, and in the morning will wash their faces to remove the sleep dirt from their eyes and to freshen them up a little after the night's sleep.

I am positive that the large majority of persons bathe less frequently than they ought to. Many think that once a week is amply sufficient, and in consequence the Saturday night cleaning up for Sunday has become almost a national institution. This is very wrong. Since plumbing has now become so comparatively cheap that all the comforts of bath and closet are usually to be found in the most moderate houses, want of the necessary facilities can be no longer a valid excuse for want of thorough cleanliness.

I would enunciate as a rule that a full bath ought to be indulged in daily. Dr. Wilson says, "The best and most convenient time for taking the bath is just after getting out of bed in the morning."

Here I must take issue with this noted sanitarian. It is, no doubt, the most *convenient* time, since it is only

necessary to remove the night garment and plunge into the bath, after which the ordinary dressing only is necessary, and this bath will tend to waken and refresh the body. But it is not the *healthiest* or *best* time, for the following reasons:—

For a person in health, the warm bath is undoubtedly better than a cold one. I do not mean *hot*, but warm, that is to say, the temperature of the body, about 98° Fah.

Suppose you take such a bath in the morning. The warm water will tend to open the pores of your skin, and when you subsequently go out (particularly in winter) you will be liable to *take cold*. This warmth will invite the blood from the internal organs to the surface of the body, which will thus become full of blood. When the cold air of winter suddenly strikes the surface, it will contract the pores, as well as the blood vessels in the surface, and will suddenly and rapidly drive this blood back into the vital organs, congesting them and predisposing to disease. Particularly will this effect be disastrous if any organ happens to be weak or already diseased. So that while it would be better for all to avoid morning baths, they will be positively injurious to any one with a weak or diseased internal organ.

On the other hand, suppose your bath-room is next to your bed-room. While undressing, you can run a warm bath; when ready for bed, jump in, and after soaking for five or ten minutes, stand up, soap your body all over, and lying down flat again, rinse the whole body, washing off the soap, and with it the day's accumulation of dirt and dead organic tissue.

You will emerge from the bath thoroughly purified, the warm water will have had a soothing effect, that will predispose to and very much aid sleep, good, healthy, sound sleep. Then rub every inch of your body thoroughly dry, and taking a coarse towel, or a flesh brush (if your skin is not too tender), rub briskly all over, until the surface of your body fairly glows and tingles, then putting on your night dress, jump into bed. You will sleep splendidly. During the night the pores will slowly and gradually contract, the increased amount of blood in the surface will, by degrees, become diminished, the temporarily deranged circulation will slowly revive its equanimity, and when morning comes all will be well. There will then be no risk of taking cold or of having an undue determination of blood to and a congestion of any organ. But the clean and freshened body will rise from a healthy sleep, ready to undergo a full day's work. If, now, you will resort to "Franklin's Air Bath" in the morning, in connection with this warm bath the night before, you can take my word for it, your body will be immaculate. You will not require extracts, or colognes, or bay rum, to make you smell good, the purity of natural cleanliness will emanate from every portion of your body, and you will give forth an odor of freshness that no perfumer can imitate.

Dr. Wilson says, "persons who are very liable to catch cold, and who are unable to indulge in the cold bath, will often find that bathing the head, neck, face and chest with cold water will act as a very efficient means of protection." Those who will bathe as I recommend, and go *immediately* to bed, need have no

fear of catching cold, no matter how sensitive they may be.

His recommendation, "that bald-headed people, who have a constant dread of catching colds, should try soaking the head every morning from a sponge dipped in cold water, or from a small basin, as a preventive," is very good, and ought to be practiced, since it comes under the category of the hardening process already referred to; and he goes on to say, "Indeed, there can be very little doubt that colds would be far less prevalent than they are, if cold water was used much more freely in the wash-hand-basin when the cold bath itself is dispensed with."

This can be readily understood. What is generally known as a *cold*, the bunged up (to be slangy), uncomfortable, stuffy feelings, that, falling short of real disease, yet make one feel intensely uncomfortable and unfit for any labor, mental or physical, are really due to the checking of this insensible perspiration about which I have told you. One of the principal forms in which the dead tissue is given off from the body is in the shape of carbon. If all this material given out in twenty-four hours were collected and solidified into one mass, it would weigh in the neighborhood of eight ounces; just think of it; half a pound. Between one-third and one-half of this quantity is exhaled from the skin. Now, suppose the skin is interfered with in its action. The vital processes go on all the same. This same quantity of carbon is generated, and must either get out or poison the system. If the skin cannot remove it, it must seek some other outlet, and in doing so, impose extra work on whatever organ it may call

on, and these organs being unable to remove it all, some will remain behind to produce the languor and lassitude so familiar to those who have frequently had colds. From what I will say (in the chapter on sleep) about the influence of carbon on the system, you can understand why this would be so.

Now, then, you understand that heat will expand, while cold will contract anything. The pores of the skin are no exception to this rule.

If, then, a person is accustomed to using warm water on all occasions, for washing, or to pass the majority of their lives in unnaturally and unnecessarily warm rooms, their pores will become unnaturally dilated. The skin will be performing a great deal of work, more than is really necessary for the typically healthy life of the body. In proportion to the extra work done by the skin, will be the lesser work done by the internal organs, since the obliging skin will relieve them from a portion of their duty; and this extra cutaneous action will not be really injurious to health or longevity, because the skin is not truly a vital organ; it may become much diseased, and yet if the internal vital organs are healthy, life can be prolonged.

Therefore, if this excessive work on the part of the skin, and the unnatural dilatation of its pores could be constantly maintained, it might even prove beneficial, since it would greatly aid and assist the internal organs. But such is impossible. Every one who is not bed-ridden must occasionally go out. They must at times subject their bodies to the action of cold.

When they do, this sudden exposure will produce *excessive contraction* of the pores, just as any stimulant

applied to any overly sensitive surface will produce excessive stimulation, and this sudden interference with the normal action of the skin will unexpectedly throw an excessive amount of work on the internal organs, which they will resent. This means *catching cold*.

Ordinarily, clothing will protect the major portion of the body from these sudden influences, but there are certain parts that will be uncovered, and on them the cold will act. If these parts are kept constantly in good condition, in a state of tonicity, as they will be by the use of moderately cold water, they will never become so thoroughly relaxed as to admit of the sudden action of cold injuring the body by contracting them. Just as any sudden demand will disturb the pre-concerted plans of any business man; if, for instance, he has made his plans to pay five hundred dollars a week, and is unexpectedly called on to pay a thousand, so will any unexpected and unusual demand for performance of duty on any of the internal vital organs derange them. If the skin is always doing its share, the other organs will do theirs; but if the skin is abruptly interfered with, and sends some of its load of debt, unexpectedly, to be paid by the vital organs, they will not be prepared for it, and the strain they will undergo in performing this duty will result disastrously to them.

In order that the skin may be kept in this healthy and equable condition, it is only necessary to observe the two rules already enunciated, viz. : warm bathing at night, just before going to bed, and cold water for washing the exposed portions of the body.

When you think what a large surface is represented by the skin, and when you remember how many

little organs it contains, and how they are constantly at work, removing the dead tissue, you will be prepared to understand how important it is to care for the skin. You can imagine how good action on the part of this organ (for it is an organ, since it has a function) can afford much relief to the internal organs, and can enable them to very much prolong their period of activity and usefulness.

Thus, then, you can understand why so many persons *take cold*, when you realize how few ever think about the skin. Even those careful persons, who realize the importance of and endeavor to care for the organs inside of them, for the liver, kidneys, stomach and bowels, hardly ever give a thought to the skin. The old saying that "Familiarity breeds contempt," seems to be well illustrated here. A man cannot see and become intimately acquainted with his internal organs, therefore, if told how to do so, he will respect them. But he can see his skin at every minute of the day, and so, becoming familiar with it, he does not consider its care of any importance. He imagines that if he cares for his internal organs his skin will take care of itself, and he gives it little thought. If he does ever think of it, he considers it merely as a *covering* to his body, and something similar to the covering of a bale of dry goods. He never looks upon it as an organ, and an important one (as I hope he will now do), and an organ playing an important part in the phenomena of life, and one upon whose integrity so much depends his physical welfare. A very important point in connection with washing is, to thoroughly dry the part that has been washed. When a person washes the hands

and hastily mops them with a towel, leaving them damp and moist, they are very apt, more particularly in cold weather, to become chapped.

But now, there are some persons living in the country to whom baths are denied, because they have them not in the house. To those who own their own houses, and can afford it, I would say, have the bath introduced at once; you must look upon it as important to your welfare as you do heat.

But, if you cannot possibly have it, I will suggest the following substitute: Every night have brought to a *warm* room a tub of water, strip yourself, and with a large sponge and soap, wash yourself from head to foot; then rub and go to bed as recommended. While nothing can thoroughly and efficiently take the place of the full bath, yet this general washing will prove the best substitute.

If the bath is taken daily, it will require but a few minutes to cleanse the body, so that the weakening influence of a prolonged bath will be avoided.

In this connection, a few words on "Shampooing" will be appropriate. It is not at all necessary that a man should go to the barber's to have his head cleaned; he can do it, and do it better, himself.

If he will procure good castile soap, and about three times a week thoroughly soap his head, when in the bath, and after making a good lather on the surface, vigorously rub it well into the scalp and then wash it out again, his head will be ever pure and clean.

In conclusion, let me describe an ideal bath. With a tub full of water, at a temperature of about 98° Fah., soak for a few minutes, then standing up, thoroughly

soap the whole body, putting the soap on thick. Then turn on a warm shower bath, and while the water falls from a height on the head and trickles down the body, wash the head thoroughly. This will carry the soap and the dirt with it all away from the surface, and enable you to go to bed with a thoroughly pure and clean body.

SEA BATHING.

For those of my readers who happen to live near the sea coast, a few words on this subject will possess a peculiar interest.

The ordinary ocean bath, as indulged in at most of our fashionable watering places, is not near as cleansing as a bath in ordinary fresh water, with plenty of soap, in a bath tub; but it serves other purposes. It is, of course, to a certain extent, purifying; but its principal benefit is to be derived from the following factors:—

1st. It is, unless indulged in to excess, a most commendable form of exercise. 2d. It promotes cheerfulness and good spirits. One of the most invigorating and cheerful sights possible to conceive, is that presented on the beach at Cape May, New Jersey, every day about noon, during July and August. For, probably, more than a mile, for more than an hour, there is a constant panorama. Men and women in every conceivable variety of bathing costume are tripping down from the bath houses to pay a visit to old Father Neptune.

On a "*good day*" the waves roll in, break on the beach, and toss the water and foam far up on the sands.

Some timid bather standing, as he imagines, just



SURF-BATHING AT CONEY ISLAND, N. Y.

beyond reach of the incoming water, is suddenly surprised by an unusually strong wave, which buries him ankle deep. With a shriek and an Oh! my! that would be considered altogether *un-Wilde* like in the prim environs of a city, he jumps back and scampers away, pursued by these tantalizing minions of old Neptune. His pretended fright causes a general laugh, in which he himself joins. After a while he ventures further out, and becoming braver, absolutely has the impudence to attempt to dispute the right of way with these powerful water waves of time, when he finds himself unceremoniously picked up as a chip, and submerged as a fish, from which predicament he once more emerges, with his eyes, his nose, and his mouth full of salt water, blowing and puffing like a porpoise, looking like a drowned rat, and brimfull of good humor.

At his ludicrous appearance, new merriment and laughter is created, and so on, for an hour, goes this scene of unparalleled enjoyment. If I were asked to mention a time and place in which the greatest number of happy persons can be found, I would say, go to Cape May and visit the beach during the bathing hour.

But there is such a thing as "*too much of a good thing.*" Ocean bathing can be, and is frequently, carried to an injurious excess. It is really a form of exercise, and the same results of excess will be produced here as I have already indicated in the chapter on *exercise*. Very few persons, when carried away by the excitement of ocean bathing, stop to realize how much force they are expending. When a bather sees a huge

breaker approaching, he will very often turn his back to it, and bracing himself firmly for the expected onslaught, will let it break over him. Some, more wisely, will throw themselves on top of it and allow it to do what it will.

To realize how much exertion, how much force is expended in endeavoring to resist the resistless power of these incoming waves, allow yourself to remain passive, make no effort to stand up against them, and see how far they will carry you toward shore.

This exertion will prove positively injurious to any one who may have weak or diseased organs. Even during the warmest days of summer ocean water is cold. Every one experiences more or less of a shock when he first enters it. He feels chilly until his *whole surface* is thoroughly submerged, and any portion of the body that may be subsequently exposed will be chilly and cold.

As a rule, which you can understand plainly and appreciate the reasons for, from what I have already said, the surface of the body must be kept warm. If it becomes unduly chilled, the blood vessels in the surface must contract, and forcing the blood out of them, it must go somewhere, and flowing unexpectedly into the internal organs, will produce congestion of them. If, now, these organs are in perfect condition, they will be thoroughly capable of returning this blood to the surface and so relieving themselves.

Whether this return takes place or not, you can determine by the fact of whether you re-act or not. If, after the first chill experienced upon entering the ocean, you become comfortably warm, then you can

make up your mind that the temporarily congested internal organs have relieved themselves; that the blood driven away has returned to the surface, and that ocean bathing will not be injurious to you; but, on the other hand, suppose you have been induced to bathe by the example of your companions. Suppose, when you dash in, you feel cold, and this chilliness continues. If, after a short time of real discomfort, you emerge from the ocean, and *shiver* and *shake* up to the bath-house, so exhausted that you can hardly dress, you can rest assured that sea-bathing is injurious to you, that you do not properly re-act from the shock, and that you had better abandon it.

You will then derive much more benefit from using the warm salt-water baths to be found at nearly all watering-places.

Therefore, I would enunciate as a general rule for the guidance of those contemplating ocean-bathing, the following: If you are in robust health, and perfectly sure that all your organs are healthy and sound, then you may indulge daily in a bath of fifteen minutes' duration, not only without fear of any injury, but with absolute benefit to your health and longevity.

But if you know that you have any weakness, if you have reason to suspect that you are not thoroughly sound in every particular, then will it behoove you to be very careful.

Not only may the cold water act, as I have explained, by producing a congestion of this particular weak organ, but the very physical force of the waves may produce mechanical injury of some weak spot. To illustrate, and thus make you comprehend how such

accidents may and do occur, I will make the following quotation from a letter written by Olive Logan to the *Philadelphia Times*, and dated London, October 26, 1881. She says:—

“The death of Lord Justice Thesiger was the result of a singular cause. When the deceased legal light was a baby two years old he had scarlet fever, which was followed by inflammation of the left ear. He was deaf in the affected ear, more or less, all his life, and three or four years ago he consulted a celebrated physician about this trouble. It was found that the *membrana tympani* or (drum of the ear) was perforated, and artificial protection was advised. A few weeks ago the deceased gentleman was bathing in a rather rough sea, when he was knocked on the left ear by a heavy wave. Intense pain soon followed, coupled with stiffness of the neck, which indicated that inflammation had extended along the internal passages. The best medical and surgical talent was summoned, but nothing could save him. It should be mentioned that at the time the wave struck the Lord Justice his *ear was not protected*, and I record this case in the hope of warning readers against the danger of going into the sea without protecting the ears with small wads of cotton. At the French watering-places the attendants are always provided with cotton batting, which they offer to bathers. On exceptionally cold days, too, it is well to protect the ears from the bitter winds with cotton.”

While such a case as this one is, fortunately, very rare, yet it is liable to happen to any one. I will explain to you some little about the mechanism of hearing, and you will understand this.

When a man beats on a drum, he sets the parchment top in motion. This motion is communicated to the air inside of the drum; from this it is conveyed to the covering on the other end; this in turn sets the outside air in motion; this sound, by causing successive waves or motion of the outside air, is conveyed through them to the ear. These vibrations pass in the ear, until they meet its drum or *membrana tympani*, which is a thin membrane stretched across the channel of the ear, at a certain distance within the external orifice. This, which corresponds to the parchment top of an ordinary drum, is set in motion, and conveys these sounds to nerves, which, arising from its inner surface, terminate in the brain, to which organ all sounds are carried and by which they are *really* heard.

Now, suppose any sudden force, as of a heavy wave, is thrown against this delicate drum. It may rupture it, and allow the irritating salt water to flow into the delicate parts beyond.

In the case of the Lord Justice, recorded, a perforation of this membrane already existed, which was probably very small, but still large enough to allow a wave striking him forcibly, full in the ear, to push some of its water through and cause death.

This jumping around and excessive motion while bathing in the ocean will be injurious to any woman who has disease of the womb. This organ is suspended in the cavity of the abdomen by very delicate ligaments or cords, strong enough to hold it in position under ordinary circumstances; but if the womb happens to be displaced, this violent motion may further increase the displacement.

Women ought to avoid sea bathing when their monthly sickness is on them. At this time all the genital organs, that is, all the parts that are called into action during this period, are in a state of congestion; they contain an excessive amount of blood. The sudden chilling of the surface may determine an extra flow in this direction, thus producing a dangerous congestion, that will, most probably, result in disease.

You may think I am laying too much stress on what will seem to you as very unimportant items. But let me tell you that it is just these very small matters, apparently, these seemingly insignificant details, the attention to or neglect of which will do so much to shorten or prolong life.

When a person becomes seriously out of health, he or she is compelled to consult a physician. But she cannot always have a doctor at her side, to say, you can do this and you cannot do that; this would be impossible. Neither does she possess the knowledge to enable her to realize what seeming trifles will, if oft repeated, ultimately so derange the delicate human machinery that no medical skill can repair it; when, as a result of youthful indiscretion, the mature woman may be doomed to a lifetime of invalidism and suffering.

I know of no other temptation that so attracts the young American girl, living along the Atlantic coast, as sea bathing. Its fascinations, I must admit, are great, and to the young well-nigh irresistible. I have myself had experience, and have known the time when I thought *one hour* too short for a bath. I am sure, *now*, that I was then foolish, and that, far from being

benefited, I have been really injured by this over-indulgence.

It will be impossible to cause the young man or woman to believe what I say, if I appeal to their reason. They will call me, as they do all those who advise them against their impulses, "*old foggy*," and will laugh my admonitions to the winds. This is always the way with headstrong youth. Did you ever see a boy of twenty who *did not* (in his own estimation) know more of the world than his antiquated old grandfather of eighty. Yet, usually, when this well-meaning but impulsive boy grows into a mature man of forty, he *commences* to understand how little he knows, and realizes what a fool he was at twenty, until, when he becomes sixty or seventy, he begins to realize that he is commencing to learn.

Therefore it becomes the duty of those having charge over the young to see that they do not remain too long in the ocean.

I can truthfully say that it will be impossible to find a healthier residence, in summer time, than the seashore, for those to whom such a climate is not interdicted by some particular disease; but this same desire to be fair forces me to say that very many young persons counteract the benefit to be derived by this two or three months' sojourn, by excessive bathing. I have been in the habit of annually visiting the seashore, for so many years that my first visit goes way back beyond the limits of memory; hence, I have had ample opportunity to know what I am talking about.

I have seen apparently hearty men enter the ocean, as buoyant and happy as any one could be. Disporting

for a time with the waves, they will suddenly throw up their hands, and sink like a piece of lead, before assistance can reach them. Every one on the beach is stricken with awe. The word passes from mouth to mouth, and is carried up to the town, to be retailed at every dinner table, that "*a man was drowned this morning.*" In truth, he was not drowned. Very few persons are ever truly drowned by accident. This man has had, probably, a weak or diseased heart, but one that would have lasted him, under ordinary circumstances, for many years; he goes into the ocean, and overstraining this weak organ, it gives out; he dies, from heart disease, and his dead body sinking under the water, it is given out that he was drowned. Or, some of the vessels in his brain may be weakened by disease (such as I will describe in the chapter on alcohol), and while strong enough to withstand any ordinary pressure, may yet be too weak to rebut any unusual demand on their resistance. When he enters the ocean, and subjects himself to the violent exercise of combating these powerful waves, his whole body becomes overstrained; his heart beats more powerfully and more forcibly; it forces the blood with unusual power against this weakened vessel; it ruptures, causing apoplexy and unconsciousness; the senseless body sinks beneath the water. The *automatic* respiration that always takes place in an insensible person draws into the lungs *water* instead of *air*; the man dies, and it is currently rumored that he was *drowned*, when, in reality, he died from apoplexy; or to go back to the first cause in both these illustrative cases, he has died from *too much bathing*. Even without any violent exertion, a man predisposed to

apoplexy may have an attack precipitated by ocean bathing. If, for instance, the vessels of his brain may be, as I have said, weakened, the very shock which the first entrance into the sea always gives to every one, the fact that the lower portion of the body is the first immersed, will all tend to increase the force of the heart's action, and to determine the blood to the head; and when, to these forces acting from below, is super-added the influence of an August sun on the head, heating it, you can understand how a congestion and consequent rupture of this weakened vessel may occur.

Do not endeavor to refute my statement by telling me that you know of some old lady or gentleman who has for years been in the habit of bathing in the ocean during the coldest days of November or December. I know of such cases myself; and they have not experienced any appreciable ill-effects. I answer your endeavored refutation by saying that we must argue from the *rules* and not the exceptions. I will tell you about old General Patterson (of Philadelphia), who, in spite of his disregard of almost all the rules of health, lived to be ninety years old. A short time before his death, one morning, in market, he was purchasing his provisions, as he had done for many years, and there stood looking at him two men, one of whom, Dr. Joseph Leidy (Professor of Anatomy in the University of Pennsylvania), said to the other, look at General Patterson, is he not a wonderful man? See how active he seems, and to be out in market this early in the morning, at his great age! The answer came back, *he is not a man, he is AN ANOMALY.*

And he was. Though he observed some of the rules

of long life, yet he led such an apparently indifferent career, that, had he not possessed more than an iron constitution, he would have died many years sooner than he did.

His life was an exceptional one. When we desire to deduce rules, we must do so from the majority, and not from the exceptions.

Therefore, it will not do for you to reason that because you yourself, maybe, and many of your friends, have indulged in sea-bathing to an excessive degree, therefore it is harmless.

You must ever remember that the majority of young persons, those between the ages of eighteen and thirty-five, can do most anything and not experience any bad results from it at the time being. They may abuse themselves in the most outrageous manner, and yet not feel its effects for some time.

Very few men grow rich in a few months or years; it requires time for them to accumulate wealth. In some exceptional instances great wealth is acquired in a short time, but the majority of substantial fortunes are accumulated by a very slow process.

So it is with disease. Some diseases are developed very rapidly. Like the recent banking company in France, they may grow rapidly and assume large proportions, with a subsequent rapid collapse; their growth has been a diseased one, and can only be productive of injurious results very rapidly.

Again, some diseases are more substantial; they take longer to develop, are slower in their growth, become stronger in their very slowness of growth, and when ultimately developed into a diseased condition

are more difficult to eradicate. It would be as hard to *bankrupt* a man worth *fifty millions* of real estate as it would be to cure a disease that had been gradually accumulating in intensity for as long a time as the real estate magnate had been gathering together his property. •

Thus, then, can you understand how any chronic disease of any organ may take hold of a man so that it becomes almost or really a part of himself.

Therefore, while excess in bathing, as in anything else, may not seem to produce any disordered condition of the young and buoyant system, it will be dangerous, because it will surely make an impression that, by prolonged and frequent repetition, will ultimately cause some serious disorder of a nature incompatible with long life.

Remember what I have said about the excesses of youth being drafts upon old age, and you will realize the force of this statement.

One should never go into the ocean after a hearty meal. The common belief that it is almost sure death to bathe very soon after eating is erroneous; it is one of those popular fallacies, based on superstition, and having no true foundation in either science or experience. But, while not necessarily fatal, it is yet a very injurious practice, and ought not to be indulged in. As I have explained already, when the stomach is digesting a meal it requires plenty of blood, *but not too much*, and it demands repose. If the cold water strikes the surface, driving the blood in excessive quantities into the internal organs, it will produce a congestion of the stomach as well as the other vital organs. The violent

exercise will jar, jostle and derange the stomach, so that perfect digestion will be out of the question. The food not digested will undergo putrefactive decomposition, and thus becoming a foreign and poisonous substance, will probably cause vomiting or diarrhœa, in its endeavor to get out of the body, while it will at the same time be very prone to plant the seeds of chronic congestion of the stomach and consequent dyspepsia.

Buff Baths.—What are commonly known at American seashore resorts as *buff baths* are to be strongly condemned. The practice of getting out of bed, and with all the pores of the body wide open from a night passed in repose in a warm bed, and, stripped naked, exposing the weak and exhausted body, weak because it has received no nourishment for many hours, to the chilling early morning wind blowing along the beach, and plunging into the water not yet warmed by the influence of the sun's rays, can only result in physical injury. The exertion put forth will then be doubly injurious, because the body is weak, while the danger of producing internal congestion of a serious nature will be increased, because of the unusual coldness of air and water.

I have known some *young bloods*, after the morning bath, to resort to a fashionable restaurant, and sitting down in company for several hours, to freely indulge in champagne or ardent spirits in the form of mixed drinks, eating the while. Pretty soon they become somewhat intoxicated, and imagining that a dip in the ocean will *sober them up* and refresh them, off they go to the bath houses, and again putting on their still damp suits, go again into the sea.

They might as well go to see a case of smallpox ; for, while the injurious effects in many cases will not be as immediate, they will be much more certain. The liquor, in addition to the warm weather, has determined the blood to the skin, and the free perspiration gives ample evidence that the pores are wide open. The irritating liquor has also irritated the internal organs and predisposed them to congestion. When, now, the cold water suddenly comes in contact with these greatly distended pores, they must, of course, contract ; perspiration is checked, while the blood is driven inward to produce congestion. I have known such young men to emerge from the sea feeling much worse than when they entered it ; with purple lips and skin, shivering and shaking, sick at the stomach, headache, backache, and such a general bad feeling as to plainly indicate that their remedy for intoxication has been much more injurious even than the disease.

Again, some will organize parties for bathing at night, by moonlight. While this practice is no doubt very romantic, it is very unhealthy. The same chilliness of air and water are present that render the buff bath injurious, and in addition, the body is exhausted after its day's labor.

Business men who are compelled to go every day to the city, returning to the seashore late in the afternoon, are often in the habit of stopping for a dip on their way from the station to the cottage. Necessity makes this practice permissible, and if indulged in with judgment, it will not prove injurious. If you will remain in the water for only a few minutes, and then, after reaching your house, throw yourself on the lounge

for a few minutes before supper or dinner, as the case may be, you will derive positive benefit; but, if you struggle and wrestle with the waves for half or three-quarters of an hour, and then going to the nearest bar-room, fill yourself with whisky to remove your chilly sensation, as so many do, particularly those who go down from Saturday until Monday, then you had better have left the bath alone and gone straight home.

Having now told you how *not* to bathe, it will be in order to point out how you can resort to this wholesome pastime so as to derive benefit from it.

I will tell you this, by describing the life led at the seashore by an individual named *Ideal*.

When the warm days of July come around, and all city business becomes paralyzed by the enervating influence of the excessive heat, Mr. Ideal moves off to the seashore. If he is not engaged in active mercantile pursuits, he does not once visit the city until the middle of September, when he comes back invigorated for another winter's labor.

If he has a business to look after, he so organizes and arranges it that it will go on smoothly during this dull season, with weekly or semi-weekly visits from him. Of course, Mr. Ideal is a merchant in business for himself; clerks cannot do as he can, but, being his own master, he can so arrange his affairs as to take a long holiday; because he knows that if he does not do so, the constant worry and anxiety incident to his large business will prematurely consume his vital capital, as surely as it will increase his pecuniary wealth. He realizes that Gould, with his millions, can find time for his fishing expeditions along the coast of Jersey; that

Drexel, with his enormous and growing business interests, can yet spare time for occasional prolonged absences from his counting-room in search of renewed health and strength.

Being a sensible man, Mr. Ideal reasons that if these men, whose business is so much greater than his own, can go away for the summer, he can follow their wise example, organize his business and do the same. If Mr. Ideal is a literary man, he knows that he can do his writing just as well and even better when mentally invigorated by the life-giving atmosphere of old ocean than if he remained in the hot and dusty city.

So reasoning, he makes his arrangements, and bidding farewell to bricks and mortar for a time, he finds himself snugly ensconced in a little frame cottage down by the sea.

He has gone for his health, and knowing how he ought to live, determines to so live. About six o'clock in the morning he gets up, and if the weather is fine, goes for a half-hour walk on the beach; then he has an appetite for breakfast; after which he sits around for a while, reading or writing. About half-past eleven or twelve o'clock he removes his clothing, and putting on his bathing suit, over which he throws a wrapper, and with slippers on his bare feet, walks down to the bath-house, to which he has sent before him a pair of flannel drawers made like pantaloons. Throwing off his wrapper and slippers, he stands about the beach talking with friends for ten or fifteen minutes, in order that he may get thoroughly cooled off, and have the temperature of his body reduced near to that of the surrounding atmosphere, so that when he enters the

cold water it will have a less injurious effect on the surface.

Seeing his son, with some other young boys, running around and playing leap-frog, he calls him, and explains that by this exertion he is over-heating himself, and opening the pores of his skin, when he will be more likely to take cold on entering the water.

When he feels well cooled off, but before he gets chilly, he walks briskly out into the sea, until he is in water knee deep, when he at once dives head first into the first breaker that comes in. Then, unless the undertow is unusually strong, he keeps on out until the water reaches up to his armpits. Here he floats, and swims, and dips under each breaker, taking care always to have his head wet and his body well under water. He never goes out on to the beach, as he sees many others doing, lying around in the sand, with the air evaporating the water from their clothing and chilling their bodies, and then going back into the sea. He knows that he would be very apt to take cold if he did. He realizes how easily this beneficial bath may be made a great injury to him. He has read that a prominent English physician has stated, in England's greatest medical journal, that he believes nearly every one has a temporary congestion of the kidneys immediately after coming out of an ocean bath. He knows enough about medicine to understand that if he bathes properly this congestion will be but transient and will pass away, while if he is imprudent, frequent repetition may convert this temporary condition into a permanent and veritable disease of the organs.

He does not climb up on another's shoulders, neither

does he allow any one to mount his and dive over his head, because he feels that he is receiving enough exercise and expending a sufficiency of force, in simply standing up against the powerful breakers and being tossed about by them, without making any unnecessary effort.

He knows that this method of bathing is very tame, and realizes that his young and thoughtless companions are laughing at and calling him "*old fogy*," and an "*old stick*." But he gives this ridicule no further thought than to feel confident of the old saying, "*that every dog has his day*," and to remember that the time will come when the laugh will be on the other side, when these young scoffers will have reached mature age, and reaping the fruits of their imprudence in chronic ill-health, will probably look back to the days when they jeered at the staid, antiquated method of bathing of Mr. Ideal, whom they now see, apparently, not one day older than he was twenty years before, and sighing, wish they had followed his example.

When he has been in the water for fifteen minutes, resisting the pressure of his friends to remain longer, he goes out, and tarrying not, walks straight and fast to his bath house. Removing his wet suit, he first *mops* his body dry with soft towels, and then rubbing with coarse ones, or even with a flesh brush, makes his whole surface fairly burn and tingle. The dry flannel pants, wrapper and slippers are donned, and he walks home. A servant washes out the bathing-suit in *fresh* water, and bringing it up to the cottage, hangs it out to dry, in readiness for the next day.

Sometimes Mr. Ideal enjoys a little *toddy*. If he

happens to be in the humor, he indulges it at this time, because he knows that a small amount of liquor just after a bath will not do him any harm, and will, most probably, be absolutely beneficial. He occasionally also enjoys a cigar.

His servant, knowing this, will have a nice little table in one corner of the porch, with two easy chairs. When he sees Mr. *Ideal* and his intimate friend, Mr. *Perfection*, coming up from the beach, he quickly mixes up two mint juleps, or sherry cobbler, or porter sangarees, or whatever mild, mixed drink he knows by experience his master and his friend prefer, and placing them on the table, with a *pure* cigar by the side of each, and a plate of crackers and cheese between them, he arranges similar chairs, and mixes lemonades with a little sherry, or weak claret or milk punches, for the wives and *adult* members of the two families.

Mr. *Ideal* does not stop in a bar-room on his way home, because he knows that if he does, he will be very apt to meet a crowd of thirsty and rollicking friends, who will make it well-nigh impossible for him to get away after one drink, when he will most likely indulge in three or four, in rapid succession, and made of liquor of a much inferior quality to that waiting for him, in consequence of which the sharpness of his appetite will be blunted, and he will be very apt to go home with a headache, since the body just after an ocean bath is unusually susceptible to the influence of liquor.

Sitting down to this cheery table, with his family around him, Mr. *Ideal* sips at his drink, nibbles at the crackers and cheese, and slowly puffs at his cigar, talking the while to his friend. This is the delicious "*Dolce*

far niente," the "*Otium cum dignitate*" of the seashore. Very soon both gentlemen become drowsy, conversation becomes interrupted, and laying down their cigars, they throw back their heads and doze for half an hour. Waking up refreshed, Mr. *Perfection* goes home and Mr. *Ideal* gets dressed, so that by two o'clock he is ready for a good dinner.

The afternoon he passes in reading, writing, driving or walking, and the evening in the same way.

He never goes in bathing in rainy weather, because he knows that to derive benefit from it he ought to have the warm sun shining on himself and the water.

He knows that some men will go out sailing or fishing in the morning, and hurrying home, rush down to the beach and bathe. But he will not do this, because he feels tired after his trip on the water, and knows that it will be injurious to him to bathe when he is exhausted. Besides, *when he does anything, he wants to do it thoroughly*. When he goes fishing, he wants to *fish*, and when he goes bathing, he wants to *bathe*, and he does not want to hurry from the one to the other.

When September comes, Mr. *Ideal* returns to the city a thoroughly renovated man. He is strong, vigorous, and has accumulated an ample stock of vital force to carry him through the winter. So he goes on, working in the winter to make money, loafing in the summer to enjoy it. The years pass by and he remains the same. He seems to grow no older. He is ever active, cheerful and contented. He seems to possess some mysterious secret of perpetual youth, and every one says, "how well Mr. *Ideal* wears; he does not look a day older than he did forty years ago."

And they wonder at it. But if they were to seek Mr. Ideal himself, he would tell them that his excellent health and youthful appearance was due merely to the fact that he had not only studied "*how he ought to live*," but that when he found out, he was ever after careful to so regulate his every day life.

The nearer my readers follow this example, the greater benefit will they derive from a sojourn at the seashore; the further they wander from it, the less good will they experience.

Children ought never to be forced into the sea. You must remember that some children are possessed of that exceedingly nervous temperament that makes the grand old ocean, with its wonderful and ever rolling breakers, a source of real terror to them.

I have frequently been so aggravated that I could hardly hold my tongue, when I have seen women dragging, with all the force of their superior strength, little children into the water, the little ones shaking, screaming and holding back, all of which the parents seemed to think was funny, and would laugh at. But I can assure you that such coercion is anything but funny to the little victim. I have known some children to be frightened into convulsions on the spot, while severe and oftentimes permanent derangements of the nervous system will be the result of this infantile fright. If your baby or little child is afraid of the ocean, put on its bathing suit and allow it to sit on the beach, playing with the sand; or maybe it will sit in one of the little pools of salt water left on the beach by the retiring tide, which has been made unusually warm by the sun. By degrees, by doing this day after day, and avoiding

all efforts to induce the child to enter the ocean, so as not to make it think of that which it fears, in time familiarity will succeed dread, and the child will of its own accord enter the water.

Salt water is a tonic ; it gives tone to and invigorates the body. Therefore, it would be well for parents to have a bucket or two of sea water daily carried up from the ocean to mix with the warm fresh water in baby's bath. The improvement in your child's physique will amply repay you for the trouble.

LIFE AT THE SEASHORE.

An outline of a healthy life at the seashore has been given in the sketch of Mr. Ideal, but it will be well to go a little more into this subject.

From the very hour of birth until about the twelfth or thirteenth year, the seashore offers an unequalled health resort for all. When this age has been reached, both for moral and physical reasons, it will be better for your sons and daughters to pass the summers in the country, and avoid fashionable watering-places, until they have grown into mature and thoughtful men and women. When very young, they are under your control, and you can regulate their lives so that they will conduce to their physical and moral welfare ; but when they reach that age of budding independence about which I have already written, surrounded by the numerous temptations of a fashionable resort, which no one has a right to expect a childish mind to be able to withstand, they will cause you many a heartache, and you will find it utterly impossible to keep them out of mischief, if they are so inclined. The very reprehensible practice of having children's hops at the large ho-

tels, while gratifying to vanity, by affording the opportunity for parents to display their children's costly clothing, is sadly detrimental to the physical welfare of these poor little things.

If, now, you refuse to allow your children to visit these hops, you are considered unkind and cruel, and unless your offspring are remarkably obedient and docile, they will be tempted to become deceitful and to surreptitiously enjoy the pleasures they desire and see others indulging in, and of which they consider that you are unjustly depriving them. These hops are used only as an illustration. Every one who has ever visited the seashore at a fashionable summer resort has noticed the degree of freedom, ease and familiarity that there obtains, amounting, frequently, to absolute indecency and immorality. At home, if your young daughter meets a gentleman and he asks permission to visit her, you will find out who he is before you give your consent. At the seashore she is introduced to some stranger, maybe a handsome, fascinating man; a waltz is followed by a suggestion to promenade on the piazza, this leads, maybe, to a walk on the beach, and—God only knows what. He alone can foretell what a lifetime of misery may result from this terrible social freedom, so common and so tolerated at the seashore.

Physical detriment results, also, from these wrong methods of living. If a young girl gets overheated in the ball-room, and goes out to walk on the piazza, ten to one she will take cold, that may eventuate in consumption. Do not tell me that persons never take cold in "*salt air*;" they do; this is a dangerously fallacious idea, and the sooner you are rid of it the better.

Young men have an idea they can drink more liquor at the seashore than at home. While it would seem to be a fact that it requires more alcohol to make a man *drunk*, yet these precocious youths must not flatter themselves that what they consume is doing less injury to their internal vital organs than it would at home; for it is not. While the invigorating and stimulating salt atmosphere prevents the stupefying effects of the alcohol from being manifested as soon, and therefore delays actual *beastly drunkenness*, yet the poison is doing its sure work on the inner organs all the same. Under this delusion, they make up their minds to drink all they can get, to have a regular spree, and it is because of this fact that I have issued this word of warning.

It is very tempting, when father and mother are going home at ten or eleven o'clock, from a walk, or from looking on at a hop, to see young persons indulging in a chicken croquet, or salad, terrapin or champagne. *So, the devil is very tempting at times.* This supper will taste very good and be very pleasant; but you had better be careful. If you are really hungry, and feel as though you required some nourishment, a few good, raw oysters and a glass of ale or beer will be much more wholesome than any rich, heavy food. As a rule, eating late at night is injurious, but when one is really in need of food, then something plain will be indicated, and will not do any harm; while rich food is injurious at all times, it will be particularly so when indulged in late at night. I have had friends, going down to the seashore for a day or two, who would take along only the *low shoes* they happened to be wearing. Getting

into the midst of an influx of mosquitoes, their lives became tormented by these little animals biting right through the stocking ; be sure to always take with you a pair of high shoes.

As I have said before, I do not desire to make my rules very strict, because I am anxious to have them observed. So that if you will carefully follow the easy ones I have elsewhere enunciated, and add to them my instructions about bathing, you can rest comfortably sure that you are leading a very good life, and are not doing anything calculated to shorten your earthly existence.

CHAPTER XI.

SLEEP.

Sleep that knits up the raveled sleeve of care,
The death of each day's life, sore labor's bath,
Balm of hurt minds, nature's second course,
Chief nourisher in life's feast.

I imagine that very few of my readers know the origin of the familiar household saying,

“To go early to bed, and early to rise,
Will make a man healthy, wealthy and wise.”

John Wesley was so impressed with the importance of going to bed and getting up early, that he made it a point of his religion, and the above was his motto; and Wesley was right.

We have nothing to do here with the moral influences of late hours, and will confine ourselves to the nature and necessities of sleep, and the advantages of going to bed early and of early rising, in order that we may enjoy good health and long life.

A great philosopher has said, “Take from man *sleep* and hope, and he will be the most wretched being on earth.” This profound thinker knew what he was saying. Sleep is as necessary to life as is food. Every act of life, every word, thought, movement of every kind, each contraction of the heart, every performance of the liver, kidneys, and all other organs, entail, as a result of their performance, not only the destruction of tissue, about which I have told you, but also a certain amount of fatigue. The body becomes exhausted in every part, from the mere act of living.

The exhausted system must be recuperated ; it must rest, while the vital organs are generating a new supply of force to enable these same functions to continue. Those who live in large cities know that during the day the gas-works are busy making the illuminating gas which, stored away in reservoirs, will at night serve to give life and brilliancy to the streets and houses. At night the supply is used up and exhausted, and must be made over again the next day. After a while these works will wear out and become useless, when new ones must be built ; they possess a certain capacity (though we cannot accurately measure it) ; each day they generate new gas, but a time will come when they can do so no more. The works of a watch give power to move and to live a mechanical life, to the watch, but they run down at night and must be wound up.

So it is with the human body. Its various parts supply the vital force necessary to life ; and while they possess from birth a certain capacity, as the gas-works do, yet their power to keep up this supply will become prematurely exhausted, unless they are allowed intervals in which to recuperate. The demand made on this force during active, waking life is greater than the supply. Therefore it becomes rapidly consumed, and when night comes the human gasometer is nearly empty ; it has sunk down very low. The works have run down, and need winding up. The body becomes exhausted, and plainly indicates that it requires rest. Now, then, when the eyes are closed, and the external world shut out, see what takes place. When asleep, every function of the body is carried on less rapidly.

All the voluntary duties and performances of life are absolutely suspended. Thought, motion, sensation, are all in abeyance, they are, for the time being, dead, so that vital force is not required to keep them in activity. The internal organs are slowly and quietly performing their duty. Like the engine of a hotel elevator, that is reduced to a low degree of activity during the small hours of the night, so the energy or active life of these organs is brought down to a minimum, because the demand is so slight. They are like unto a horse that, after a hard run, is allowed to walk along a shady country road, in order that he may gain strength for another run. They act slowly, generating a certain amount of vital force, a small portion of which is consumed in giving them power to do their duty, while the remainder is gradually stored up and accumulating in the various parts of the body, that is being, as it were, wound up.

After a while a sufficiency of this force is accumulated, the exhausted organs and parts are refreshed, and are ready to again resume their active life. The man awakes, with a fresh amount of vital force in every portion of his body, and is once more ready to start on his daily active duties. Thus you understand the importance and necessity of a full amount of sleep. When you become tired and exhausted, you can, by an exercise of your will-power, or by the use of artificial stimulants, *drive* your body to do more work; but you will do so at the expense of your health. It will be like forcing a jaded horse to more exertion by a liberal use of the whip and spur. He will go on, because you force him to do so; he must move, since a power

stronger than his own commands it; but he will suffer in health and strength for this unnatural labor. So it is with the human being. A man of strong will can labor even when very much exhausted, but the strongest man will surely, sooner or later, suffer for this abuse of his organs. This is a fact that cannot be too strongly noted, since overwork and too little rest and sleep are the greatest enemies of health that we have in this country. When an energetic, go-ahead American has any labor that he desires to accomplish in a given time, it matters not to him how long he works; he is ready to turn night into day, and will not rest until he has finished his task. This hurry and want of rest is the greatest cause of the large number of premature physical wrecks that we daily meet with. An imperative law of nature is, that the whole body must be absolutely rested (such rest as it can only receive from sleep), for a certain number of hours out of every twenty-four.

As will be seen from the appended tables, the largest proportion of aged men now living in the United States have made it a rule to retire about ten o'clock and rise at six. From this, as well as from the universal experience of the world in all ages, we are led to draw the conclusion that a healthy man requires, in order to maintain his health and strength, eight hours of sleep.

It is not a matter of indifference, as many suppose and claim, *when* you take these eight hours. There is a proper time for everything, than which no other time can be so good, and this holds good in an especial manner in regard to sleep.

Since sleep is indulged in for the purpose of reno-

vating the exhausted energies of the body, it becomes plainly evident that the proper time for sleep is when the body is exhausted. And it will be equally apparent that work of all kind ought to be suspended when this fatigue comes on.

It is almost universally conceded that early rising, when not carried to an extreme, is beneficial to health; therefore, this point needs no discussion. If, then, a man rises at six, takes his breakfast at seven, works until one or two, when he has dinner, and labors again until six or seven, when he takes supper, and then devotes the evening to some amusement, light reading, conversation or the like, when ten o'clock comes he will feel tired. This, then, would be a signal that the body required rest, and that it was time to go to bed. If, now, this notice is unheeded, and the man continues or commences to force his organs to keep on working into the small hours of the night, he is treating them with injustice, and they will resent it. From midnight until daybreak the body is weaker than at any time during the twenty-four hours. If, then, work is done when the body is in this weak condition, such labor will prove a severe strain on the organs. It will not only exhaust them unnaturally, but will, in addition, make demand upon the reserve force which they ought at this time to be accumulating and storing up for the life of the next day.

Even with those who do not rise early, but lie in bed until eight or nine o'clock, this same weak period will come, and they will ultimately suffer, if they are not in bed and asleep during its continuance.

One reason of this weakness is to be noted in the

fact that it comes on after a period of fasting, when the fuel derived from the last meal has become nearly used up, and when, were it daytime, you would consider it necessary to eat again. Therefore, some might suppose that food taken into the stomach at this time would counteract the weakness. It would to a certain extent, though not entirely, but it would also at the same time produce a new trouble. It would impose extra work upon the stomach to digest it, whereby this organ would be robbed of its requisite rest. There is no use in talking about these laws of nature. They have been formulated by a wisdom far superior to finite intelligence, and must be obeyed strictly, if we desire long and healthy lives. The civil laws of a city, state or country must be regarded to the letter, else anarchy and demoralization will ensue; so must the natural laws of health, else disorganization and disease of the body will inevitably result. Besides, food alone will not entirely counteract this natural weakness, since it is partially the result of the use or vital activity of the body throughout the day. The only true and thorough remedy or antidote is *sleep*.

Going to bed at or near the hour mentioned would not be tasteful or even possible to the lovers of fashionable society, whose *swell* entertainments usually commence about that hour. But the majority of hygienic laws are diametrically opposed to the laws of our perverted social intercourse. As long as fashionable society remains as it is to-day, human beings must decide between the two. They cannot possibly follow both strictly, and it is almost impossible to reach a happy medium. The majority of men and women must

put these two questions before them, and decide for themselves which to follow:—

1st. Become ardent members of fashionable society ; go to balls and parties, eat late suppers, go to bed at two, three or four in the morning, and remain there half the next day ; be constantly complaining of headache, dyspepsia and backache, and *die young*, or

2d. Eschew fashionable society, living in accordance with the teachings of hygiene and experience, enjoying all *rational* pleasures as every *sensible* man and woman does, and never have an ache or pain, feeling always well, cheerful and happy ; never experiencing either the *heartaches* or the unnatural stimulation and abnormal depression of the devotees of fashion, and finally dying *old men or women*, whose memory will be loved and cherished, and whose never-to-be-forgotten examples will be held up for the guidance of future generations yet unborn, while the butterflies of fashion pass prematurely away, as little noticed and regretted and as soon forgotten as the leaves of the forest ; save, maybe, their faults, vices and shortcomings may live after them, as warnings of the mode of life bound to insure early death.

Oh ! ye wise and thrice blest residents of God's country. Assemblies and balls and late suppers have no temptation for you. Your vigorous forms and ruddy cheeks give full evidence that you are strangers to the ruinous dissipations of fashionable city life. Your bed, sought early, contains rest and refreshing sleep for your healthily fatigued body. There is no tossing and turning and lying awake for an hour or so, from a stomach endeavoring to assort and digest a medley of

crabs, croquettes and chicken salad, swimming around in a large quantity of champagne. You do not awake in the morning (as your society brethren do) with your mouths coated and foul, your stomachs deranged, your heads ready to split, and your bodies more exhausted than when you retired. Yet you really enjoy life. The wife has no cause to distrust her husband, neither has the husband reason to be jealous of his wife.

Your children look up to, love and respect you, because they know that you are living in accordance with the laws of God and the dictates of nature and good sense. *Fashionable society and good sleep are incompatible.* My young readers may scoff at this and call me an old foggy. They have perhaps for a few years been great society members, and yet they sleep well and seem well. Very good; so they are; I do not deny it; but let them have patience and wait, and when they have passed from the youthful age of impulse and inexperience into the riper period of thoughtful life, they will look back and say, *that old fool* who told us "*How We Ought to Live*" was nearer right than we thought he was. When the man of thirty-five or forty is continually complaining that his *liver is out of order*, suffers all the time from dyspepsia, never knows what it is to have a good night's sleep, he will sit down to reflect, some time, when, from the ashes of the past will rise up, like accusing angels, a long list of champagne dinner parties, of pretty girls and balls, of assemblies and flirtations, of terrapin suppers at three o'clock in the morning. When lying awake at night, unable to sleep, though he has worked hard all day and retired early, these visions will again come be-

fore him, and he will despairingly cry out, "Why cannot I sleep as I used to; when I enjoyed all those good things, I used to sleep like a top." Yes, but my friend, you were then abusing yourself; you were making unnatural demands on your inheritance of vital force. Your capital was then large, and could meet all demands made upon it; but, by extravagance, you have so squandered it, that now, but slight exactions will create a panic, for you must remember that a very wise man has said, "*That the excesses of youth are drafts upon mature age, payable twenty years after date.*" If such a man reads this book, he will be very apt to say, "*Why did I not know these things in time. Oh! curse those foolish pleasures that have robbed me of the pleasure of good sound sleep.*" To such I would say: Cheer up; be of good heart, my friend. I have already told you "it is never too late to mend;" if you will carefully follow the advice given in these pages, and persevere in it, good sleep will surely come to you, unless you happen to be the victim of some severe disease, when your condition passes beyond the scope of this work, and the services of the physician become necessary.

If you realize that your inability to sleep is due to an improper mode of living when young, then does it become very important for you to advise your children. Do not endeavor to force them, for the reasons already given, but, knowing yourself how disastrous the lives they may be leading are apt to prove in the future, use the means I have already indicated to alter their tastes and inclinations, and to make them realize the true nature and dangers of the course they are pursuing.

After many years of discussion, it has now been definitely settled that during sleep the brain is in a state of *anæmia*. That is to say, there is less blood in it than during the waking state. As a result of this condition, all the functions of the brain are less actively carried on, its life is less intense, it is in a state of partial suspension, as it were. Therefore, receiving less nourishment (*i. e.* less blood), it acts less vigorously, and as a consequence, all the vital phenomena under its control are less active. This condition of anæmia of the brain, with lessened activity of all the functions of the body, constitutes *true sleep*. There is a condition called *stupor* or *coma*, which, while it simulates, yet is not identical in any material particular with *true sleep*. When a man comes home intoxicated and falls across the bed in a condition of drunken unconsciousness, he does not *sleep*, though he seems to do so. Instead of having less blood than usual in the brain, he has more, but the blood is poisoned; it is full of carbon, which has such an evil influence on the brain that it interferes with all its duties and functions. If a man were to sit in a hermetically sealed room, in which charcoal was burning, he would soon become unconscious; he would not be asleep, but his senses and the functions of his brain would be suspended by the poisonous influence of the charcoal fumes. His condition would be precisely similar to that of the man in the drunken stupor. Alcohol is rich in carbon (charcoal), and it acts on the brain just as the fumes of charcoal do. To prove that this condition is not that of sound sleep, I will recall to your mind two facts with which you are no doubt familiar. Let a healthy man, upon rising from a long

night's refreshing sleep, drink a very large quantity of whisky; at first he will be stimulated, but in a short time, though he has done no work, he will fall into this condition of *apparent sleep*, and will so remain until the carbon has been removed from his body, while, if you feel his head when in this condition you will find it to be warm.

Now, it would be impossible for the desire for *healthy and natural sleep* to come on so soon after several hours had been passed in this state, and it would be likewise impossible for the head to be warm unless there was a great deal of blood in it.

Again, the headache, the *bursting* feeling that supervenes upon a debauch, is evidence that there has been too much blood in the head.

The moral I desire to draw from this is, that excessive use of alcoholic drinks is inimical to *true sleep*. Since alcohol in large quantities will produce a congestion of the brain, that is to say, will determine an unnatural flow of blood into it, so in smaller and frequently repeated doses, will it produce the same condition. Since, then, a lesser amount of blood is one of the absolutely necessary conditions of sleep, so a greater amount will interfere with it; and thus may the *tipp'ing* habit become a powerful agent in the production of bad and wakeful nights.

There are many men who, while not coming under the category of drunkards, yet go to bed every night more or less under the influence of alcohol. As they convivially express it, they are *mellow*. The next morning they yawn and stretch, turn over and over again, hate to get out of bed, love the *second nap*, and when

finally they do reluctantly get up, feel tired and exhausted, and wonder at it.

The day before has been passed *moderately* correctly; they retired early, and, as they supposed, slept soundly all night. Yet they are almost as tired as when they went to bed, and feel totally disinclined for a day's work.

But they have not *truly slept*, as they imagine. They have been in this condition of stupor. Their organs have not rested; their nervous systems have not been quiescent. The alcohol they imbibed the day before is a foreign element; it can serve no good or useful purpose in the body; the organs do not want it, and these faithful friends and sentinels, realizing that its presence will be injurious to the healthy life of the body, work all night long to remove it. Denying themselves the rest they have so well earned and so much require, they labor for the general good, and when morning comes and the man is sober, they are exhausted. Still they are forced by the exigencies of business to keep on working.

Is it any wonder, that the sleep of him who goes to bed *mellow* is unrefreshing, and that his organs become prematurely exhausted, and he dies before his time?

When the brain is in a state of activity, when it is performing any duty, it is full of blood. This blood is contained in vessels or tubes that ramify throughout every portion of the organ. When the time for sleep comes these vessels contract (they contain contractile tissue in their walls or coats), and forcing the blood out of the brain, produce the conditions that I have described as essential to sleep. When this feeling comes on, when you are sleepy and desire to go to

bed, and the regular time for retiring has arrived, suppose, by the force of your will, or by the use of some stimulant, capable of keeping the brain full of blood, you interfere with the natural contraction of these vessels; see what occurs.

If you take a piece of India-rubber, and alternately stretch and allow it to contract, its contractile power will remain intact for a long time. But suppose you keep it constantly on the stretch; after a time it will lose its power to contract. So with these blood vessels of the brain. If you refuse to allow them to contract when they want to, and keep them on the stretch abnormally long, after a while they will lose their ability to contract, and will remain permanently dilated. The circulation through them will become sluggish, as it would through a distended hose, if the engine or power forcing the water through it were just the same as that which had performed the duty when the hose was much smaller.

So, then, you have explained in a few words the reason why sleeplessness is such a usual accompaniment of excessive brain work.

I must again say that there is a time and place for everything. Nearly every person has at times experienced that familiar feeling of drowsiness and desire for sleep that follows the ingestion of a very hearty dinner. This is because the stomach requires a large supply of blood to digest this large amount of food. It therefore makes demand upon the other portions of the body for a temporary loan, just as the merchant does upon his neighbors when he has a large note to meet and is *short*. The brain is very accommodating,

and allows the stomach to draw upon it for the amount of blood necessary. Hence the brain is *comparatively* bloodless, and a desire for sleep ensues. But, now, suppose this obliging friend makes a sudden and unexpected demand upon his creditor; suppose he calls in his loan as soon as it has been made; the borrower must suffer, his note must go to protest. So, then, suppose you commence some mental work immediately after eating a hearty dinner; the brain must of necessity call back from the stomach the blood it has loaned, because it cannot work without material, any more than the stomach can, and as a result the stomach lacks the necessary power to do its work, and dyspepsia is the consequence.

Now, then, when the various organs in the body are exhausted from a long day's work, and they require all the blood they can get to repair their waste and to generate new force for the ensuing day, they ask a loan from the brain. They say to it, "you have done your full share of work; it is time for you to rest; you are the most important portion of man; you are the organ that raises him above the level of the brute; it is necessary for you to take care of yourself, else you cannot take care of us, and we look to you for guidance and support. Lend us your material, and while you sleep we will work slowly and steadily, and when morning comes you will be refreshed, while we will have made much progress; we will carefully invest the capital received from you, and will return to you to-morrow what you have given to us, but increased many fold, so that you will be again enabled to direct all our movements for the general good of the individual.

If, now, this request is refused, as it will be if the brain is required to retain a full supply of blood to meet the demands of over work, not only will the brain suffer from over-distention and loss of sleep, as I have described, but the other vital organs will also suffer from too little blood and the consequent interference with their appropriate duties.

There is a time when the brain must be full of blood, in order that it may work, and there is a period when it must send this blood away, in order that it may rest and sleep. If these two demands are not heeded, sleep, *true, good, healthy, refreshing sleep will be impossible.*

When a man is in health the brain is capable, if left to itself, of regulating these periods properly, but when meddling man comes in and interferes, he may derange the whole machinery. So that the feeling of fatigue and desire for sleep, coming on in the evening, ought never to be disregarded. It is the voice of the whole body, exhibited through the brain, speaking in unmistakeable terms, and demanding *sleep*. If this demand is disregarded, and the inclination fought against, the desire will pass away, and many wakeful, restless, tossing hours will be impotent to woo it back again.

Some men, in very good health otherwise, still will experience great difficulty in getting to sleep. It will be well for them to look within themselves, to minutely examine their habits, and to ask themselves whether they are addicted to anything that will be calculated to keep an undue amount of blood in the brain. I have already pointed out how alcohol will do so, and also

the influence of excessive work. Anxiety or mental activity of any kind will do the same. As I have shown you how excessive exercise will prove injurious, so I will tell you that excessive mental activity will preclude sleep.

You have heard of excessive and sudden pleasure or joy producing death. Every one has gone to bed at times, after an evening unusually full of pleasure, and to save their lives have been unable to go to sleep. The mind is so active, thinking over the pleasures that have been experienced, that the brain is kept full of blood, and sleep is a stranger.

When this condition of sleeplessness, in an otherwise healthy man, persists for any time, it becomes sufficiently serious to require some measures to overcome it.

I will recommend some of the simple measures, such as can be safely employed, without the advice of the physician, and without fear of injury. First and foremost must be advised *exercise*, such as I have recommended in the chapter devoted to it.

There are very few cases of uncomplicated sleeplessness that will not yield to well-directed and persistent exercise.

If, with the exercise during the day and just before retiring, the warm bath is resorted to, and the body is subsequently kneaded and rubbed, as recommended in the chapter on exercise, sleep will almost surely ensue.

If, however, these means fail to produce it, then you must resort to some measures capable of drawing the blood away from the brain, and producing the necessary condition of *anæmia*. What is known as *counter-irritation* must be tried

This consists in using certain means that will have a tendency to draw the blood from one part to another. You all know how potent a mustard plaster is in relieving any congested part, how quickly it will oftentimes remove and relieve a threatened attack of pleurisy. How it will draw the inflammation that is causing the pain from the inside to the outside of the body, where it is comparatively harmless. From this we learn a lesson. As you now know, the blood vessels throughout the body are continuous, they all communicate one with another. Then, when you irritate any one part the blood is drawn toward such part, the vessels therein become dilated, and some other portion of the body must lose the blood that is so attracted. Here, then, is our indication. Mustard and heat are both counter-irritants ; they will both tend to draw the blood toward any part to which they may be applied. Therefore, if you will fill a small tub with very hot water and stir into it a goodly amount of mustard, you will have an excellent counter-irritant mixture. Now, sitting on the side of the bed, in your night-clothes, put your feet and legs into this water, which should be as hot as you can possibly stand it. Let them soak there until the water commences to get cool, then withdrawing them, have the feet and legs thoroughly well rubbed with a coarse towel. This will tend to draw into them an excessive amount of blood, which will be supplied from the brain, when this organ will become depleted and you can go to sleep.

If this method does not prove entirely satisfactory, you can add to it a large mustard plaster applied over the nape of the neck. And, just here, a word about

how to make a mustard plaster. Do not, as most persons do, put *flour* into the mixture, *so that it will not burn so much*; you want it to burn all it can. If you desire a plaster six inches square; take a piece of old rag six inches wide and twelve inches long. Use the strongest mustard you can get. Mix it up with warm water and smear it on one half of the rag, about one-eighth or one-quarter of an inch thick. Then turn over the clean half of the rag on top of the mustard, and fold in the edges. You will thus have a thickness of rag interposed between the mustard and the skin, so that the part will not be soiled. Then let the plaster remain on as long as you can possibly bear it. Do not remove it as soon as it commences to burn. You desire to make a profound impression, and unless you do so, you might as well have saved the material for salad dressing. If it blisters, so much the better, a blister will do you no harm; a little lard applied to the raw surface, on a rag, will soon heal it, and the beneficial effects of the plaster will be much increased.

If, after using the simple means recommended, you are obeying all the advice contained in this volume, and are leading a strictly correct life, in accordance with all the rules herein laid down, and yet cannot sleep, you can feel very sure that disease of some kind is the cause of the sleeplessness, and that you had better consult a physician. But be very sure that you are doing what you ought to. I have heard, more than once, men criticise others for not doing the very same things that they failed themselves to do, and it always reminded me of the immortal couplet—

“ Oh ! wad some power the giftie gie us,
To see oursels as ithers see us.”

Many men will think they are doing and living as they ought, when, if they asked some good, true, disinterested friend, he could and would point out to them many errors. Therefore, before you conclude that your inability to sleep is the result of disease, be sure that it is not due to faulty living, and directly your own fault, and the remedy in your hands. Give a fair and prolonged trial to the remedies I have suggested.

If you have been engaged in excessive mental occupation, whether of a business or literary character, and find that you are passing sleepless nights, give it up at once, before the vessels become permanently dilated; close your books, run away from your office, and for a time lead the life of a ruminant. Go where your thoughts will be diverted from their routine work; absolutely abandon your accustomed labor, and exercise freely.

Too much stress cannot be laid on exercise and variety of occupation as a cure for sleeplessness. Monotony of existence will produce it in a healthy man, while the reverse will remove it. No man ought to lie awake at night, yet very many do. They do so because they do not live as they should.

The thought wells up in my mind, as I write, and must have utterance, else it will overpower me. As I look out of my window, unto the ever-changing scene presented by the passage to and fro of almost countless numbers of men and women, each one occupied about his own affairs and heedless of everything and everybody, save that which he desires to accomplish, I think, poor creatures, how little the majority of you realize what you are. How seldom you consider where

you came from and where you are going. How few of you young boys stop to consider, in your headlong pursuit of pleasure, how differently you will view yourselves, life and its purposes, in a few years. How little thought you rich men and busy merchants give to yourselves. How you regard your body as merely a something to serve your selfish purposes, to gratify your passions. How little you all realize the purpose for which *God Almighty* has allowed you to exist. How seldom you consider that you are puppets in His hands. That He has placed you in the world as portions of his grand design of the universe. That He has given to you free will, and allowed you the power to abuse it, and that most of you do so abuse it. How little any one can tell how soon you will die. How impossible it is to say that, as you walk along the street, in seeming health and strength, you may not the next minute fall a corpse. Oh! these reflections make me sad, when, realizing from them the uncertainty of human life, I yet see how careless, and thoughtless, and indifferent my fellow men are about conserving to its utmost limit this precious boon.

Coming back from the digression, for which I must beg pardon, and plead *feeling* as an excuse, we will go on with our subject. The number of men who lead *strictly* correct lives are very few, and so also is the number of very old men very limited.

Many make professions, but do not practically carry out the doctrines, of a healthy life. They do not practice what they preach. Some among this class really seem to think that they are living correctly; their knowledge of hygiene and of the effects of certain

modes of life are so meagre that they honestly do not know they are doing wrong, while others, better informed, can and do recognize their shortcomings.

Therefore, again I would say, before a man makes up his mind that he does not sleep *because he is sick*, he ought to be very sure that it is not because *he does not live correctly*.

To decide this question, he must carefully remember and consider all the advice contained in all the chapters of this work. If he can conscientiously say to himself that he has faithfully carried out all the doctrines and precepts herein laid down, and still cannot sleep, then he had best consult a physician.

A few words about *naps* will be necessary. They are very bad institutions, but, like everything else that is not absolutely vicious and sinful, they may at times be not only allowable, but really beneficial.

If, for instance, on account of some business demand, a man loses a portion of his night's rest, then will his body derive benefit from making up the deficiency in daytime.

Or, if a merchant or a clerk, who has been busy all week, eating in restaurants and hurriedly stuffing himself, on Sunday sits down with his family, and, feeling comfortable, eats an unusually hearty dinner; then, when the drowsiness (of which I have already told you, and the mechanism of which I explained) comes on, a short nap in an easy arm chair will promote digestion and will be beneficial to health. But if such a man were to regularly lie down on a lounge and sleep the whole afternoon, it would prove injurious, because his stomach would participate in the general sleep or rest of all his organs, and would not thoroughly digest the dinner.

A nap in the daytime cannot take the place of sleep at night. Some persons seem to think it a good idea to sit up working until way into the small hours of the morning, and to make up for this loss of rest by an afternoon nap. This is an erroneous idea, and can only be injurious to health. The Almighty has plainly indicated, in numerous ways, that He intends the day for work and the night for sleep, and has demonstrated by experience that any continuous infraction of these laws can only result disastrously. As I have already intimated, change of scene will prove a powerful promoter of sleep in any one in whom sleeplessness is not due to any definite disease. Therefore will it be well for the busy merchant when he finds himself lying awake at night, calculating and running over his day's business, utterly unable to drive these thoughts from his mind and to sleep, to leave them utterly behind him, and going off to some entirely new scenes and surroundings, occupy his time purely with pleasure. Let him go on a fishing trip, or a gunning expedition, or if he lives near the coast, take a sea voyage. It is a very damaging and erroneous view that most men entertain, that they cannot spare the time for these recreations.

"All work and no play," you are aware, "will make Jack a dull boy." It will do precisely the same with Jack's father. If the man works all the time, a period will come when it will be impossible for him to work any longer. Disease and death will come stalking in and force him to give up. Will it not be better, then, for him to parley with death, to postpone its coming as long as possible? This he can do, if he will.

If his desire is to accumulate an immense fortune in a

very short time, no advice, I fear, will make him live as he ought ; money is so attractive to him that he will work night and day until he accomplishes his purpose. But if he is a sensible man, and views wealth as he ought to, for what real pleasures it can bring him, and as a means of protecting his wife and children from want after his death, then may he be induced to believe in the truth of the following idea. If a man can make, by working moderately and exercising plentifully and enjoying life rationally, ten thousand dollars a year, and can keep this up for twenty years, he will make two hundred thousand dollars ; if, now, his living costs him five thousand dollars a year, and at the end of the twenty years he dies or becomes disabled for work, then will he have a snug little sum laid by for a rainy day and for his family. But, suppose he laughs at so small a sum, and aims to make fifty thousand dollars a year, and succeeding, becomes fashionable and extravagant, and spends forty thousand ; he may die in five years, from overwork, when he will have accumulated only one-half as much as his less ambitious and more sensible neighbor. These two pictures are drawn from life, from my own experience, and their counterparts, I am sure, will immediately suggest themselves to my readers.

Overwork and the worry accompanying the desire for inordinate wealth cause more disease and more premature deaths, directly and indirectly, than all the acute, contagious diseases put together.

If a man has *money* constantly on his brain, he cannot have good sleep, any more than he can walk when he is sitting down. The mind must be tranquil and free from care, else he cannot sleep.

I am going to describe the life of a business friend in this city, which will serve as a model for those men who desire to have, and enjoy good, sound sleep. His mode of life is truly a wise one. He is a physician, and knowing how he ought to live, does live in accordance with this knowledge.

Engaged in several different business pursuits, no one works harder during the day than he does, from Monday morning till Friday night. But, now, after these five days of hard work, he shakes the dust of the office from off his feet, and going to his home, some twelves miles out into the country, far away from his ordinary surroundings and pursuits, spends Saturday and Sunday among his magnificent collection of books, breathing into his body constantly the purest of country air, *and really enjoying life*. When, on Monday morning, he again returns to the city, he is re-invigorated, and is ready for five days more hard work. Occasionally, he packs up his satchel and goes off to the seashore for a few days. This man knows how to live and work. He thoroughly appreciates the means by which he can secure good sleep. His business is so well organized that it goes on all right during his absence.

Now, were he to remain constantly in his office, and attending to business, he would, no doubt, make more money. But he is not a *fool*; he has sense enough to realize that there is something above and beyond wealth in this world, and he desires to secure it. He makes enough for all his reasonable wants and some to lay up besides, and is satisfied. He desires to live long and be healthy and enjoy life, and goes about

it in the right way. Such a man is a rarity, but so are all good examples. When found, a man who leads such a sensible life ought to be held up as an example to his fellow men.

Any one who follows such an example can rest assured that, unless there be something radically wrong with his organization, he will sleep well, and to repeat, if he does not, the services of a good physician become necessary.

So, then, to sum up, I have nothing here to do with men who are really sick. It would require a larger book than this to accurately describe all the diseased conditions that may preclude sleep. I am writing for a healthy man, in order that he may remain healthy. To such a one, therefore, eight hours of sleep out of every twenty-four are necessary to healthy life. This sleep must be secured by a reduction of the quantity of blood in the brain. This condition will be impossible, if mental activity of any kind is kept up inordinately long. So that a man ought to cease work of every kind for at least half an hour before bedtime, so that the mind may become tranquil. Then, if a man desires to enjoy good sleep and its accompanying benefits, he should make it a rule to retire at ten and rise at six. While it will be hard for many to adhere to these hours, yet they constitute the true rule, and the nearer you adhere to them the better it will be, while the further you deviate the more injurious will it be.

Regularity in hours for sleeping is as important as regularity in the performance of every other duty of life. It would be better, in the long run, for a man to go to bed regularly at twelve o'clock and get up at

eight, than it would for him to retire one night at ten, the next at twelve, the next at two, and on a subsequent night at eight, and so on.

The essentials, then, for good sleep are :—

- 1st. Regularity.
- 2d. Exercise.
- 3d. Good digestion.
- 4th. An easy conscience.
- 5th. Freedom from mental anxiety of any kind.
- 6th. Absence of over mental work, and
- 7th. To sum them all up—

An easy and equable mental condition, which cannot exist unless all the other six conditions preëxist.

Thus, then, you can realize the necessity for sleep, and how to procure it.

This book, as I have already said, is too small to exhaustively discuss all the points contained. It merely points out the main indications, the foundation upon which intelligent minds must rear the superstructure. These *light-houses*, directing you toward the port of sleep, have been erected, and if you conscientiously heed their warning and beckoning lights, you will surely sleep well, unless disease be the cause of the wakefulness.

CHAPTER XII.

DRESS.

God never made tailors and dressmakers; that is to say, He did not make their trades. When He first created human beings He placed them in a sufficiently warm climate that they might exist the year around without any artificial covering to their bodies. He furnished them with a most accurately fitting natural covering in the skin, but so arranged matters that no other was necessary.

We must believe that our first parents represented in every particular the most perfect type of human life, and that to them in their perfect state was given all that perfection required.

Clothing was not then necessary to preserve modesty, because into these pristine pure minds no thought of immodesty could enter. Possessing ideal figures, they required not the aid of artisans to add shape and symmetry to their already shapely forms.

With the entrance of sin, came the simultaneous introduction of all the artificialities of life that were unnecessary and unknown to perfection.

We must consider that had this original perfection lasted throughout the world, we would have had for one condition of our existence eternal spring, that would have rendered unnecessary any artificial covering for our bodies. Such would seem, at least, to have been one of the ideal conditions to which pure

humanity was originally destined, and which was lost by the sinful action of our first parents. When the monarch of purity became dethroned from the human mind, the demon of lust and licentiousness usurped his sceptre. It then became necessary, in order that the immoral tendencies of man might be held in check, to conceal from public view all that might tend to waken into life, foster and stimulate these vulgar inclinations. Here, then, arose one necessity for clothing.

At the same time, this everlasting and perfect spring weather became altered into seasons of changeable weather, that made it necessary to resort to artificial means to protect the natural condition of the body.

From these two conditions, out of these two necessities, must we imagine that the necessity for clothing became manifest.

But to the more *natural* minds of our ancient ancestors, it was viewed as merely a something to protect them from the inclemencies of the weather ; hence the skins of wild animals were roughly fashioned into coverings for the body.

By-and-by the art of manufacture became known ; men learned how to weave and spin, and more beautiful but less natural clothing was the result. The ancient Greeks and Romans wore their loose fitting and flowing togas, while their feet were covered with sandals. Since clothing was necessary, these learned men and great warriors conceived the true idea of its utility, and dressed accordingly. Their vital functions were not interfered with by the use of improper clothing, while their garb was more graceful and becoming than is the ridiculous style of dress of the present day.

The history of the world from the earliest times evinces a constant restlessness and desire for change on the part of human beings. This is manifested in everything. It no doubt arises from the laudable desire for progress, to improve on that which exists, and so must not be universally condemned. But, occasionally, we see the spirit of enterprise entering into and controlling certain matters that are well enough already, and had better be let alone. Then does it deserve censure, and then must it be subjected to control. Preëminently has this been the case in the matter of dress. Were it possible, there is no question that the original costume of Adam and Eve would be the healthiest and most desirable mode of *undress* for their modern descendants. But for two reasons has this natural clothing been rendered a thing impossible to our present society:—

First, because such a radical change would, until custom bred tolerance, be calculated to generate so much lust and immorality that the human race would become even more demoralized than they are, in the effort to work this reform.

Secondly, because, accustomed, as the children of civilization unfortunately are, to be bundled and wrapped from their earliest infancy, such unusual exposure of the surface would be very unhealthy.

I have seen the dress, the whole costume, of Egyptian women, from far up the Nile, which consisted merely of a narrow band of leather, to encircle the waist, from which depended fringe of sufficient length only to cover their absolute nakedness. The Indians of our far Northwest, who are subjected to the coldest of

weather, oftentimes, when found in their native, savage condition, have been known to wear but little more. Here, then, from the balmy, enervating climate of Nubia on the one extreme, and from the freezing regions of our great Northwest on the other, come living and speaking examples, to teach us that clothing is not really necessary for human nature, but is one of those unnatural necessities which the exigencies and misfortunes of artificial life have forced upon us.

But I am not writing this book for Egyptians and Indians, therefore, having used them to point my statement, that clothing is not necessary or would not be so, for man in his natural state, I will come down to the practical points involved in dress, and discuss clothing as I find it among the majority of my prospective readers.

In the first place, I will tell you that clothing does not absolutely *make* the body warm, it only serves to keep it so. Heat is generated within you; from what is, in reality, a burning or combustion of coal. A few words will explain this. Coal is made up largely of carbon; when it burns in the stove or open grate, this carbon unites with the oxygen in the atmosphere, and as a result of this union heat is generated. Precisely the same thing occurs in the body. The carbon is derived from the dead tissue, which, as you now know, has had its day, has performed its duty and is ready for removal. It is one of the products of retrograde metamorphosis. The oxygen is derived from the air introduced into the body in breathing; these two elements unite, and though you cannot *see* the flame, as you do in the stove, still, surely is heat generated.

Heat is necessary for life. You all know how impossible it would be for vegetable life to exist without the heat of the sun; so is it impossible for animal life to continue without the constant generation of this internal heat.

You have all heard the expression, "*cold as a corpse*," and are familiar with the popular notion (in which there is oftentimes much truth), that when death is approaching the nose and extremities become icy cold. This will be the case, even though the temperature of the room may be very high; and a dead man will be cold under the same circumstances. From this we learn a lesson, and by it we are taught the necessity of production of internal heat, and the fact that the body does not become warm from artificial or external heat. Nature likes *averages*, as much as she abhors *vacuums*. She will not tolerate the absence of the first, any more than she will the presence of the second, if she can help it. Therefore, if the body of man is at a temperature of 98° Fah., and he is in a room of a temperature of 68° or 70°, some of the heat from his body is given off to the atmosphere of the room, so as to elevate it and strike an average between the two. It is necessary for health that this bodily heat should be given off, because it is being constantly generated, and if not eliminated, the temperature will run up too high and cause fever. Whenever a man's temperature exceeds 99° Fah. he is in a condition of fever, and since this state is due to an excessive combustion or burning, or too little elimination, it will unnaturally soon exhaust the vital power if allowed to persist. If the temperature of the surrounding atmosphere is very low, as in

winter, it will, of course, extract a great deal of heat from the body. When, therefore, you sit by the stove, your body does not in reality become any warmer by absorption of heat from the burning coal, but owing to the fact that the air in the immediate vicinity of the stove is very warm, it requires less heat, and consequently makes less demand on your vital heat.

So that any artificial combustion really makes you warmer by superheating the atmosphere, when it requires to abstract less heat from your body.

There are certain articles of diet that are calculated in an especial manner to generate this internal heat, because they are very rich in carbon, or coal, or fuel. But leaving them out of consideration for the present, we know, from what I have already told you, that by exercise, any particular function, organ, or part of the body may become so developed as to be capable of performing almost any amount of work. The heat generating function is no exception to this universal rule. Witness the Esquimaux, who, living in such terrific cold that it is considered almost foolhardy for any one unacclimated to penetrate into their country, yet because it is necessary, on account of their very surroundings, are capable of generating so much bodily warmth that this great cold causes them no more inconvenience than is experienced by the residents of our middle States when the temperature falls a few degrees below zero. Yet they are formed, anatomically, the same as we are; but by constant use, and to supply the demand, their ability to make heat within the body has become very great. If a pork packer, of intelligence and enterprise, finds the demand for the product of his estab-

ishment increasing, he can enlarge his facilities, and if the growing demand is gradual, his production can keep pace with it. But if he has on hand only one hundred barrels of pork, and a peremptory order is received for five hundred, he must either fail to fulfill the order, or borrow, or buy from some neighbor.

So it is with bodily heat. If the body is at all times subjected to the same low temperature, enough heat will be generated to meet the demand. If the outside demand gradually increases, the inside production will keep pace with it; but if a great, sudden and unexpected lowering of the outside temperature takes place, the internal manufacture must either fail to supply this unusual demand, when the body becomes cold, or it must ask for assistance. Since it cannot borrow heat from the stove and absorb it into itself, for the reasons I have given, it must become equal to this extra demand in one of two ways. It must either generate more heat by piling on more coal, or it must resort to measures calculated to prevent the heat escaping from the body. The first can be, and is often, accomplished by the use of alcohol, which will serve to bridge over a short period of excessive cold, because, being rich in carbon, it contains fuel that will be calculated to make the vital fire burn with unwonted energy. But it is a double-edged sword; it cuts both ways; while it will make the body warmer for a while, just as the use of bellows will make a fire burn brighter for a time, yet this very extra burning will prematurely exhaust the supply of material from which the heat is derived, when, in one instance, the fire goes out, while in the other, the body becomes cold. It will not do to suppose that

this extra heat can be maintained indefinitely long by the continued use of alcohol, because after a time the alcohol will so derange and vitiate all the functions that they will be unable to generate even the ordinary or natural amount.

So that it will be safe to say, that when exposed to extraordinary cold weather for a short time, and you know that the exposure will be brief, a little alcohol will so aid the natural production of heat as to be beneficial; but if this exposure is going to be prolonged, the use of this agent will ultimately result in making you feel the cold all the more. The second indication can be fulfilled by the use of appropriate clothing, and this brings us down to the business of our chapter. Clothing serves the purpose of keeping the heat within the body. But, as you know it will not do to have too much heat retained, the surface must be cooled by absorption of perspiration into the surrounding atmosphere, else the body will be feverish. Therefore, when clothing shields the surface from the air, it must be of such a quality as to absorb the perspiration itself.

To combine, then, the two necessary qualifications for clothing, we needs must have material that is porous and capable of absorbing water, while at the same time it must be a poor conductor of heat.

There are two principal features in connection with heat that more particularly concern us in their relations to the human body, namely *conduction* and *radiation* or *reflection*. By the first, any excess of heat is conducted or taken away from the body, while by the second any outside very high degree of heat is reflected away from the body, just as light is reflected from a mirror.

From these two properties has arisen the prevalent fashion of wearing *dark* clothing in winter and *light* in summer. While the texture and thickness, of course, make a difference, yet the color is a very important factor; dark materials absorb heat, when the air in the interstices between the fibres of the garments becomes very warm, and so retains the heat in the body, while, on the other hand, light-colored material will reject the heat; it will reflect and throw it off, so that the surface will be enabled to give off its superfluous heat.

For the same reason do men wear white high hats and straw hats in summer, while dark or black ones are the rule in winter.

We will now commence from the top and go down to the feet, and tell you about each article of clothing, and what will be the best. High beaver hats in winter and high white cloth hats in summer, are by all odds the healthiest head gear for men.

For the vigorous growth of the hair, and to insure a healthy condition of the scalp, it is necessary that both should have plenty of air, which will at the same time serve to keep the head cool and save you many a headache. If you wear a low-crowned hat, it will necessarily confine a small quantity of air on top of the head, which will soon become foul and superheated, from the dead tissue and heat given off. But if you take a high hat, and have a small hole punched through either side, just above the rim, and a larger hole in the centre of the crown, it will act like the pipe of a stove; there will be a constant draught, because the heat from the head will warm the air, causing it to ascend and escape through the upper opening, while fresh air will

enter at the sides to take its place, thus creating a constant current, which will be very conducive to health. I know that many men, who prefer low hats, will continue to wear them, laughing at the small points I have mentioned, and considering them not worth attention. I cannot help it if they do; I am telling you what you *ought* to do, and if you will not follow my advice, the fault is your own and not mine. It has been because I have noticed such a universal neglect of these *small points* that I have written this book, because they are generally omitted in similar books, since, no doubt, the authors take it for granted that the public are already familiar with them.

Now, we come to collars. They should be worn loose, so as not to constrict the neck in the slightest degree. Some of the largest and most important blood vessels in the body pass up and down through the neck; just below the skin are two very large veins, which bring back the blood from the brain; if the collar fits tight and compresses these veins, it will, of course, interfere with the return, when a certain amount of congestion (of too much blood in the brain) will be the result.

Then comes under-clothing. These articles of apparel have been very much discussed, but can be dismissed with a few words. You all know that they are made of a great variety of material. Those of animal origin, such as wool, silk, hair, furs and skins, are all of them worse conductors of heat, and therefore warmer than materials derived from vegetable sources, such as cotton, linen, hemp and flax.

Therefore, in winter time you ought to wear under-clothing made of wool, for these two reasons. First,

because it will keep the heat in the body, and, secondly, because it will absorb the surface moisture. For those who can afford it, silk will be best, because it is the poorest conductor of heat, and will, therefore, keep the body warmer. Most persons will lay off woollen under-clothing during the summer; it will be much better not to do so. Wear them much thinner, of course, but wear them the year through. It will be much safer to reduce your temperature by using very thin outside garments; but keep wool next to the skin, to absorb the moisture. If you neglect this advice you will be very apt to take cold. If you have on the surface of your body some material that will not absorb moisture, it will remain on your body, and when you may happen to sit down after any unusual exertion, on a warm day, the air will so chill your body, by rapidly evaporating from the wet surface, that it will be very apt to produce the series of phenomena I have already described under the head of catching cold.

Excessively heavy under-clothing will be injurious, because such a weight will really exhaust the body in supporting it. It will be much better to dress only moderately warmly, and to supply any deficiency in heat by proper food and exercise.

It is a mistake to wear very heavy outside clothing in winter; while, of course, you must make a difference between summer and winter, yet even on the coldest days the clothing ought to be only moderately heavy, for the following reason: Some men will buy the heaviest and bulkiest cloth suit they can get, and will then go out on the coldest days without an overcoat. They have worn the same clothing in the warm house,

because very few men will take the trouble to change when they come in; or, at least, they are sure, when down town, attending to business, to run in and out from the warm office to the cold street. By this means the body, rendered accustomed to a certain degree of warmth in an artificially heated atmosphere, is not prepared to meet and resist the sudden transition to a temperature many degrees lower, and serious injury may result.

It would be much wiser to wear a moderately heavy suit, and never go out of doors without putting on an overcoat. Do not put on your extra coat and then remain in the warm room for a few minutes; if you do, you will nullify the benefits you expect to derive from it. Put it on just before you leave the house and take it off the moment you enter. A long cloak, reaching to the knees, well lined, will be an improvement on the overcoat, although in our day it is not quite so fashionable; in its capacious folds a man can envelop himself and defy the coldest days. It is so much easier to throw this cloak over your shoulders and draw it about you, than it is to pull on a heavy overcoat, pull down your under coat, that it may not project above the collar of the great coat, and button this latter about you, that I am sure the superior claims of the cloak will commend themselves to all who give it a trial.

Now we come to stockings. Very few persons realize what an important part these little garments play in the preservation of health. Two golden rules have been laid down, which ought to be observed by every one: 1. Keep your head cool. 2. *Keep your feet warm.* You can be made to understand why this latter

rule is so important by a few words of explanation. You know now that every body contains a certain amount of blood, distributed throughout every part of it, and constantly circulating around. When a part is warm it contains more blood than when it is cold, and vice versa. This you can understand, because the cold will contract the blood vessels of the cold part and so drive the blood out of them, while heat, on the contrary, will dilate the vessels and invite a flow of blood into them.

Some feet are very large and contain a great deal of blood; if, now, they are cold, this blood is driven out of them; but it must go somewhere; it cannot leave the body, so it ascends and forces its unwelcome presence on some of the warm, internal and vital organs; hence it is that *wet* and *cold* feet, which are so often companions, are such frequent producers of *colds*. When I was a child I remember how, when I would come into the house on a rainy day, my good and careful mother would remove my wet shoes and stockings, and making me put my feet first into a tub of warm water, would then thoroughly rub them, until they fairly glowed, with bathing whisky, when would follow a few minutes before the heater, and a warm, dry pair of stockings and shoes. As I write, I can recall the delicious sensation produced by my warm feet, and I do most earnestly recommend all mothers to follow this example with their children.

A few years ago there lived in our city a very eminent clergyman, who, with his other profound knowledge, thoroughly realized and appreciated the necessity of keeping his feet warm. So much importance

did he attach to it, that he kept on hand a large supply of stockings, of different weights ; outside of his window hung a thermometer ; when he arose in the morning he looked at this instrument, and decided what pair of stockings he would wear, according to the degree of heat or cold that it registered. Many persons laughed at him for what they called his *old maidish* habits ; but by this very action he clearly demonstrated how well he knew the small points so necessary to maintain health, and by the practice of which he was enabled to live to a great age and perform an immense amount of work.

So, then, it is very important that you should avoid wet or cold feet.

Now we come to shoes. I am quite sure that corns and bunions were unknown in the days of sandals. Ill fitting shoes are prolific sources of much discomfort, and are always the cause of corns. A corn is due to irritation, by which excessive activity in the outer layer of the skin is produced, which causes it to become thick and hard at the point so irritated. The various nerves of the surface terminate in the skin, in the true skin, that is, below the outer layer ; when the outer skin becomes hard and tough from the pressure and irritation, it impinges on the sensitive extremity of a nerve, hence the painful corn. If, then, an ill fitting shoe rubs or presses on any particular part of the foot more than another, it will be very apt to produce a corn, no matter where this pressure may be exerted. I have myself had a corn on my *instep* from wearing a shoe that was too tight and constricting over this portion of my foot. Therefore, shoes ought always to be suffi-

ciently loose, but not too much so. If you go to the other extreme, and have your shoes too large, they will be apt to rub your feet and make them sore by raising blisters.

A good rule will be, always to have your shoes made sufficiently large that you may put them on when new, and wear them right straight along. Of course, it will be impossible to have a new shoe feel as easy as an old one; the new leather will be somewhat stiff, and must naturally get the set of the foot; but what I mean is, that you ought not to have your shoes made so tight that you will have to go through a process of breaking them in, being able only to wear them for a few hours at a time.

I used to have a great deal of trouble with my feet. I had my shoes made to order, and would always suffer real torment with each new pair. Finally I made up my mind to buy my shoes ready-made, to select only such a pair as would go on easily, without any pulling, in the store, and that did not hurt at all. I have been observing this rule now for some years, and have no more trouble, so that I expect to buy ready-made shoes for the rest of my life. Your feet will not look quite as small nor as handsome as though you had the shoemaker make your shoes a very tight fit; but you will have much more comfort. Again, large shoes are more calculated to keep the feet warm, because they will allow space between the foot and its covering for a quantity of warm air, heated from the foot, while if the shoe fits skin-tight, the foot will thus be brought into direct contact with the outside cold air. Again, will these very tight shoes interfere with the free circu-

lation of blood, and by mechanically pressing the blood out of the constricted vessels, produce the dangers which I have already told you this condition may give rise to.

Above all things avoid *short* shoes. There is no more prolific cause of that terribly annoying, obstinate and painful trouble, "*ingrowing toe nails*," than short shoes. The best plan of shoe is the one we sometimes see, where the sole is long and broad, projecting in all directions for as much as one-eighth of an inch beyond the foot and the upper.

Having now disposed of the ordinary garments, our attention is claimed by the outside wraps or protections against inclement weather. Since all such are intended to guard us from wet, they must necessarily be waterproof. Gum shoes and gum coats are very good articles in their time and place, but you must be very sure that they are not used out of time. Since they are intended to protect you from water, you must use them only when you are exposed to water. If you wear heavy overshoes, made of gum, on a clear day, no matter how cold it may be, and the same can be said of a gum coat, you do yourself an injury. Because, while gum is impervious to water, it also refuses passage to air, hence the process of evaporation from the surface is impeded, when the water and its solid particles are compelled to remain on the skin, which is very unhealthy. This same thing will occur, it is true, in rainy weather, but then the benefit derived from the protection from wet will offset the injury from the retention of perspiration. It would be much more comfortable for a man going out on a rainy day to put on

a gum coat and walk independently along without an umbrella, and I advise all to do so ; but as soon as you enter any building where you are protected from the rain, no matter if you are only going to remain indoors ten minutes, take off your coat, or it will prove ultimately injurious. The same must be said of rubber overshoes ; never sit down in the house without removing them. Besides imprisoning the moisture of the feet, they will draw them so as eventually to become very uncomfortable. Remember, again, what I have already impressed on you, that there is a time and a place for everything, and that to derive the greatest good from any given article it must be used rightly and in its proper place. Therefore all extra wraps, of whatever character, whether they partake of the nature of scarfs or gum material impervious to water, should be worn only when you are exposed to cold or wet, and ought to be at once removed when you enter any building. If you neglect this rule, you will be very apt to take cold, and no one can tell where an ordinary cold will terminate. If you put on an overcoat and go out for a while, and coming into the house, neglect to remove it, in a short time your body will become so accustomed to this extra covering that when you again go out it will be as it would have been if you had first ventured forth without any additional protection.

DRESS FOR WOMEN.

The same advice about wearing woolen under-garments applies to women, but in an especial manner. A man will be protected to a certain extent by his outside garments, while the case will be widely different with women. Their loose dresses and petticoats will

act like a veritable funnel, while the heat of their bodies will tend to cause an upward draught, that will invite the cold air from below to flow up into contact with the surface. If, now, they wear woollen drawers and undershirts, they will be protected from this danger.

All the other remarks that have been made about clothing in general, apply equally to women, but there are some special features about their dress that require special notice. I have already had words of condemnation for corsets; I must again say something about them. To our women they are almost necessities, because by use the body has been brought into such a condition that their artificial support is requisite. When used merely to give this support, they will not prove so injurious; but very few women so use them. The theory of their use is, that the lower part, resting on the prominences of the hips, through the agency of the stiff bones in their sides, they will give support to the upper portion of the body and all the organs it contains; they really act as additional, as artificial ribs or chest walls and backbone. So far, they may do good. But the majority of fashionable women do not stop here. They use corsets as an instrument of torture really, by means of which they lace themselves until they reduce their waists to unnaturally small proportions. It will be impossible to do this without compressing the organs in the abdomen or belly, and it will be impossible for such contracted organs to do their duty. In a word, to dismiss the subject, because it is not one that admits of argument; no woman can remain long healthy who resorts to very tight lacing. Apart from

the hygienic view of the case, there is another aspect in which I wish to place it. Women who resort to this habit, do so because they imagine that by reducing their waists they are enhancing their personal beauty. If they desire to impress women as silly as themselves, perhaps they can do it; if they desire to please ultra-fashionable young men, whose mental capacity is just about sufficient to take in the calibre of a wasp-like waist, they may succeed; but if they imagine that by thus deforming themselves they will secure the admiration of sensible men and women, they had better be undeceived at once, and informed that they receive only what they deserve, namely, *ridicule*.

In wet weather it would be well for women to wear thin rubber leggings, from the knee down; by so doing they will not only keep their limbs warm, but will prevent the wet and muddy skirts from coming into contact with their stockings. If these are used, in connection with the woolen under-clothing, an old-fashioned worsted santon over the body of the dress, to protect the chest, waterproof and gum shoes, the most fragile woman is prepared to brave the most inclement weather, and to derive positive benefit from such exposure.

When a woman is pregnant, her clothing ought to be especially loose, because, if tight, it will offer a mechanical interference to the free development of the baby. At all times (but particularly for a woman in this condition) ought the following rule to be religiously observed:—

Suspend all your clothing from the shoulders, and allow no article to be kept in position by a circular

constricting force. How many boys refuse to wear suspenders, many of them strapping a belt tightly around the waist to hold the pantaloons up. From what I have said, you can understand how injurious this will be.

It would be a good plan for women and children to hang the petticoats by bands from the shoulders, and making a button-hole in either end of a piece of elastic, to attach one end to a button on the stocking, and the other end to a button on the body, to which is fastened the drawers. The ordinary elastic garter is injurious, because it exerts compression, and thus interferes with the free circulation in the skin. By the means I have suggested, all constriction will be removed from every portion of the body, and this is the object you must desire to accomplish.

I would recommend that young babies be kept in *long clothing* until they are nine months or a year old. Some friends will tell you that this will prevent them learning to walk soon; so it will, but instead of being an objection, this is in reality an advantage. Most children commence to walk too soon. The bones of a young baby are really hardly bones at all, they are more like cartilage or gristle. If the weight of the body is put upon these weak and pliable supports, they will be very apt to bend, when you will have a *bow-legged* child. I would never recommend you to *teach* a child to walk. It is a duty that comes as natural as eating, and when the proper time arrives, the child will walk of itself, without any training, and will have beautiful, straight limbs. By keeping to the long clothing for a lengthy period, you make sure that baby's limbs will be

warm, and avoid the risk of giving it cold. Whatever you do, never change from long to short clothes in winter.

So, then, we now have the main points in connection with clothing. We understand that its chief purpose is to prevent the escape of the heat generated within the body. We have studied the kinds of garments best calculated to fulfill this indication, and we know how so to dress that our clothing may not injure us.

To sum up, I will quote the following from the *British Medical Journal*:—

“THE DRESS OF THE PERIOD.—A lecture on this subject was given, under the auspices of the National Health Society, by Mr. Frederick Treves, of the London Hospital, on Saturday, February 26th, 1882 in the Kensington Town Hall, before a crowded audience, almost wholly composed of ladies. Mr. Treves, assuming that the primary objects of dressing were to cover the body and maintain an equable temperature, pointed out that in a low evening dress these objects appeared to have received little or no attention. The neck and arms, and upper part of the chest and back, were left bare; while about the lower extremities was accumulated a mass of raiment that would clothe a dozen children. In the ordinary dress of women, also, little regard was had for maintaining an equable temperature. The covering of the upper part of the chest, above the line of the corset, was very thin, perhaps that of the dress only. The region of the corset was reasonably covered, while about the hips many layers of clothing were massed. Thus the body might be divided geographically into a frigid, a temperate, and a torrid zone.

Dealing next with tight-lacing, the lecturer said that children had normally no waist; and, if a mother gave her thought to the matter for a week, she could devise nothing more fatal to health than to make her daughter wear stays 'to improve her figure.' The normal waist of a woman, which was oval in section, had a circumference of twenty-eight to twenty-nine inches; the 'elegant' waist, which was in section circular, a circumference of twenty inches; while the measurement of dressmakers' lay figures now varied from twenty-one to twenty-four inches. Mr. Treves also showed how, by the compression of the lower ribs, the stomach, liver and lungs were displaced, and their free and necessary action prevented; and quoted medical evidence of the many and serious, often fatal, consequences."

If you will well consider the hints I have given you, and exercise your intelligence to elaborate and execute them, you will soon discover that clothing and longevity are more nearly allied than you have before imagined.

CHAPTER XIII.

WHY WE OUGHT NOT TO USE TOBACCO.

Let me commence by giving the experience of an intimate friend, who has carefully observed the effects of tobacco on himself, and who, as a consequence of this observation, decided to discontinue its use: "Upon smoking a cigarette I immediately experienced the following symptoms: The first inhalation of smoke would produce a sensation as though I had inhaled an irritant gas; a sense of dryness and irritation would be produced in the region of the fauces and posterior portion of the roof of the mouth. Almost immediately a sense of dizziness and impaired mental perception of ideas and surroundings would ensue; this followed immediately by palpitation of the heart and a sense of throbbing in the vessels of the brain and head, while the pulsations in the temporal and other superficial arteries could readily be perceived to be increased in force and frequency. While in this condition, if any unusual muscular exertion were made, or should I suddenly rise from the recumbent to the erect posture, the palpitation would be much increased. Vision was not affected unless I smoked excessively, but some confusion of ideas ensued, and I found that, reading while in this condition, my power of grasping the meaning of what I read was lessened. The arm, extended from the body, showed a perceptible tremor of the hands and fingers, which did not exist when I was not smoking,

even though I used a moderate quantity of alcoholic liquor. If I smoked even one cigarette, immediately before going to bed, I felt a great dizziness upon assuming the recumbent posture, with a sense of uneasiness in the region of the stomach, sometimes amounting to a positive nausea. I would arise in the morning unrefreshed, with a dull, heavy, throbbing sensation in the head, rarely amounting to, but bordering on a headache. My tongue would be more or less coated, and a disagreeable, foul taste in the mouth would give evidence of a disordered stomach, while my appetite for breakfast would be perceptibly diminished. In the intervals between smoking, while the palpitation would cease (unless some extra muscular exertion were made), I would have a sense of *uneasiness* in the region of the heart, best described by saying that "*I knew such an organ existed.*" After having smoked for several years (some twelve), at times moderately, and again, excessively, and finding the symptoms above described to be increasing, so as to render me unfit for much mental exertion, and at the same time, being in the habit of using alcoholic drinks, I determined to find out to which poison I owed my condition of uneasiness. I accordingly passed one whole day without smoking, a thing I had not done in twelve years, and drank my accustomed quantity of alcohol. Before night the tremulousness of the hands and fingers alluded to was almost imperceptible, my appetite was much improved, my spirits rose rapidly, and I felt, generally, much better than I had for a long time. That night I slept well, and arose in the morning refreshed and with but a slight degree of the distressing symptoms alluded to present. Another

day passed without smoking and with the usual quantity of alcohol produced a corresponding improvement in my condition. The second night brought with it a sound and refreshing sleep, and I awoke in the morning feeling like a different man. Now, on the evening of the third day I thought I would try whether this improvement was real or imaginary. I lit a cigarette, and instantly, upon inhaling the first puff of smoke, I became so dizzy that I was near falling, and the same old and well-known symptoms followed each other in rapid succession. During the evening I smoked two more cigarettes and retired about 11 o'clock. The next morning there was the dullness of the head, coated tongue, foul mouth, general feverish condition, and all the train of symptoms before described. My spirits were depressed, my energy and ambition blunted, and I felt sure that I must have some serious organic disease, and that my lease of life would not last much longer. I was constantly living in a state of suspense, feeling sure that some fatal malady would soon develop itself." Now this, of course, is a marked case, but it demonstrates by actual experience, beyond a possibility of doubt, that the use of tobacco has proved injurious to at least one individual. Can any one say that what will prove evil to the one, does not have a bad effect on the many? We are all formed on the same fundamental plan. There are, no doubt, many men who will say that they have smoked tobacco for years, and yet have not experienced any of the troubles I have described. I purposely chose this exaggerated case, for two reasons, to demonstrate two propositions: *First*, if tobacco will produce the symptoms of ill

health that I have described, even in a single case, must we not consider that it possesses some properties and peculiarities which entitle it to be placed in the category of articles which *can* prove hurtful to the human being; and *secondly*, I consider this a very instructive case, in so far as it demonstrates, in this particular instance, that the use of tobacco proved more injurious than the use of alcohol. There are many men, no doubt, who are willing to admit that alcohol is a poison and will act injuriously on the human system to a greater or less extent, according to the degree of moderation or excess in which it is used, and also dependent upon the susceptibilities of each particular being to its poisonous influences, who will stoutly deny that tobacco is a poison at all. Yet in this case we find tobacco producing bad effects when alcohol failed to do so. The immediate effects of alcohol are so marked, and its use in excessive quantities produces such disgusting and revolting conditions of the human race, that we are much more ready to believe it an injurious article, because we clearly see before us the baneful effects of its immoderate use on the individual. Hence crusades are organized against its use, laws are enacted to prevent traffic in it, and moral suasion of all kinds is brought to bear against indulgence in it. The most dangerous enemies to the welfare, health and happiness of communities, as well as individuals, are generally conceded to be those who come disguised under a comparatively innocent exterior. Their claws, so to speak, their dangerous and destructive elements, are so cleverly hidden beneath an apparently harmless presence, that instead of treating them as ene-

mies, we receive them oftentimes with open arms, and failing to realize the injury they are working us, continue to entertain them as good, pleasant, and harmless company. May not tobacco be classed among these insidious enemies of the human race? I am most decidedly of opinion that it takes high rank among them. It does not produce the drunkenness of alcohol, it does not degrade us to the level of the beast, it does not cause murders, it does not make us bad husbands and fathers, it does not give us bloated faces, and it does not cause us to lose the respect and esteem of our fellow men; hence we fail to see where it does harm, and only look on its use as an innocent amusement and pleasure. Now, let us see whether we are right. Let me ask an ardent lover of tobacco, "Does its use do you any good?" If he does not frankly admit that he derives no benefit from it at all, all he can say truthfully is that it soothes and comforts him. So does opium soothe and comfort the Chinese, but would the smoker not turn with disgust from a befuddled and confused opium-eater, and be ready to write a homily upon the baneful effects of smoking opium. Does not tobacco produce analogous effects to opium? Let us see:—

EFFECTS OF TOBACCO.

Large doses will cause vomiting.
It quiets and soothes the nervous system.
It destroys the appetite.
It interferes with digestion.
It causes dryness of the throat.
It has a depressing effect.
It interferes with mental activity.

EFFECTS OF OPIUM.

Large doses will cause vomiting.
It quiets and soothes the nervous system.
It destroys the appetite.
It interferes with digestion.
It causes dryness of the throat.
It has a depressing effect.
It interferes with mental activity.

I could give you many more items of resemblance, but I merely desire to suggest to your minds the similarity of the two drugs, in order to point a question I

am going to ask. Cannot some of my smoking readers recall in themselves, or among their acquaintances, an instance where they have refused to take opium when ordered by their physician, because they considered its use dangerous, and as likely to lead to the formation of the opium habit? Now, if what I have said will turn your thoughts in a channel, the result of which will be to convince you that opium and tobacco are very similar in their deleterious properties, and that the difference between them is one rather of degree than of kind, will you not think it well to let it alone? As I will tell you about alcohol, the universality of its use is no argument in its favor. Opium is most extensively used in China, yet we, in America, decry the habit, and trust but little in any one addicted to its use. Some years ago, I heard a prominent physician (Dr. William Pepper, Provost of the University of Pennsylvania) characterize smoking as a vile habit, and make the broad assertion that no great smoker had ever continued an active life of mental labor beyond the age of forty or forty-five years. Because, he said, though his health may remain good, he seems to become indolent and languid, his former energy seems to forsake him, and he takes things as they come. At the time, being a great smoker myself, I received his statement with many grains of salt. I thought I could point to many instances of prolonged mental labor among smokers. In the years that have intervened, I have thought much, have read much, and have observed much, on this subject, and am now prepared to believe that he came very near the truth. I speak on a subject about which I claim to know something, when I

talk about tobacco. As I say, I have been a great smoker myself, and I have now, after many years' use, given it up, I hope forever, simply and only because by observation on myself and others, and by careful study of its effects, I have become firmly convinced that its use is injurious, and like alcohol, should only be indulged in by the advice of the physician. I do hope some of my readers will do likewise. Let us now, for a few minutes, study some of its effects and see how it acts injuriously. In the first place, I will tell you that it is a great cause of dyspepsia. It interferes with digestion, and thus causes all the train of evils and sufferings experienced by the dyspeptic. By this action, it causes the imperfect elaboration of our food, so it is turned into blood of an inferior quality, and our systems receive poor nourishment. Nicotine, the active principle, the most poisonous ingredient, of tobacco, is, of course, a foreign agent in the body; no part or organ needs it, and they are all anxious to get rid of it. It is removed from the body through the agency of the kidneys, thus throwing extra work on these organs, and if they be weak, they may succumb to overwork and become diseased. If you could only look into your heart and see the delicate valves and thread-like tendons there, you would wonder how it is possible for them to withstand the great weight of the column of blood which, at times, presses back upon them, and you would readily imagine that any irregularity or excess of action would snap them asunder. I have already shown you that tobacco will increase the force and frequency of the heart's action. Hence, this column of blood is thrown against these delicate valves with greater force

and so rapidly, that before they have recovered from the shock of one pulsation they receive the force of another. The heart is one of the most tireless organs in the body, acting day and night, year in and year out, yet it requires its periods of rest, just as all the other muscles do. This rest it gets and its waste is repaired during the momentary intervals between its pulsations. Now, if the heart's action is increased in frequency, the duration of these periods of rest must be shortened, hence, the heart must suffer from overwork and want of rest. Those who inhale the smoke of tobacco carry into their lungs a large amount of nicotine, which, lining their cavities, interferes with the proper performance of their function. To realize this, let any one inhale a quantity of smoke, and blow it out through a handkerchief held to the mouth; they will find a large amount of this nicotine deposited on the handkerchief. Dr. Wilson, in his valuable work on healthy life, says, "Any one who indulges (in tobacco) to such an extent as to render the tongue coated and dry, does himself an injury, and when palpitation of the heart or other nervous symptoms are induced he should leave off altogether."

The use of tobacco is particularly injurious to the young, because it arrests growth and enervates the entire system, which in turn interferes with and retards muscular and mental activity. So, parents, if you wish manly sons, keep tobacco away from your boys. You cannot do this by force. Moral suasion, and particularly example, will be your levers. You could hardly expect your young son to see wrong in a habit practiced by his father. Colton's saying is very applicable

to the use both of tobacco and alcohol by the young; he says, "The excesses of our youth are drafts upon our old age, payable with interest about thirty years after date."

I need say but little more about tobacco. So much has been written and said against its use, and yet so many persons use it and desire to believe it innocent, because they want to continue its use, that I can do no good by extending my remarks on the subject. I have and will again assure you, from a medical standpoint, that tobacco is not necessary to the human body, that it cannot do any good to a healthy man, while in very many instances it can and will do positive harm. Like every other injurious agent, the amount of evil done will be in exact relation to the quantity of the evil agent employed. Therefore, let me urge that very large class, even among intelligent and worthy men, who use tobacco, to be moderate in their consumption of it. And, since moderation in this connection is a relative term, for the guidance of those who would desire to be moderate, I would say that when you find the symptoms detailed in the first part of this chapter, then make up your minds that you are smoking or chewing too much. So long as these symptoms do not offer themselves, then, if you *will* smoke, you may have the satisfaction of feeling that tobacco is not doing you so very much harm; and by carefully noting these symptoms you will be enabled to decide what will constitute moderation in your particular case. I am compelled to say what I have just said, because I so thoroughly realize how almost impossible it will be to induce persons who have once contracted the habit of smoking to abandon

it; therefore, I feel that the best I can do is to caution such persons against its use, and to show them how they may indulge it in moderation.

Far be it from me to attempt to make persons live wisely through fear; I am one of those who believe that sensible men must be controlled by conviction, and not through fear. Still, when I find authentic cases I feel that some good may be done by giving them publicity, since, as I have already said, if tobacco is capable of doing such harm as it does in some cases, we cannot possibly regard it as entirely innocuous in the majority of instances. In this belief, I will condense from the official report of the "Transactions of the Medical Society of the County of Albany (N. Y.)" the following remarkable case: "Dr. J. M. Bigelow reported a case of tobacco poisoning. I was called hastily to see a young man who had been suddenly seized on the street with a convulsion, of which there was no premonition. I found him pallid; countenance pinched and contorted; pulse variable, being for a few seconds 136 to the minute, then 38, and intermittent. He had severe pain and distress in the left side, especially over the heart. Difficulty in breathing was marked. Cold perspiration and great prostration. Convulsions rapidly succeeded each other, without loss of consciousness. When the convulsion passed off, it was succeeded by hysterical trembling, with agonized apprehension of approaching catastrophe and death. He would clutch the arm of a bystander and beseech him to save his life, to relieve him of the great distress in his chest and threatening suffocation. I learned that this was his third attack within a year. He was an

excessive tobacco smoker, sometimes consuming ten cigars a day; he had begun its use at the age of twelve. He had little appetite most of the time, was pale and cadaverous, enfeebled, restless, starting in his sleep, and his disposition had become irritable. There was no family history of nervous disease; his own health, aside from this, had been good. Medical treatment was instituted, and in a few days he resumed his business, with directions as to care of himself, and tobacco interdicted. Four days later, I was again called hastily, and found him having symptoms as already described, but even more intense; his fear of death had become a mania, and his convulsions had become the most violent I ever saw. He had been quite fretful for a day or two, neglecting his meals and smoking eight to fourteen cigars daily. Medical treatment was again commenced. He was much better next day, but still had hysterical trembling, distress in the region of the heart, with occasional transient, convulsive agitation of the whole body. He could hardly sit upright, and had numbness of the extremities and tongue. Continuing to improve from the immediate symptoms of the attack, he was put on tonic treatment and sent to the country, whence he returned in a few weeks fully restored to health. Since then, smoking four or five cigars in succession has been, on three occasions, followed by a return, to a degree, of the symptoms. He has now given up tobacco entirely and has good health." In continuation, he said: "Investigation by an imperial commission in France, in 1861, showed that the number of paralytics and insane in the hospitals increased with the tobacco tax. The report stated that a large

number of the diseases of the nervous system and heart, found in paralytics and insane, were regarded as a sequence of the excessive use of tobacco. M. Jolly said that "tobacco seems to act primarily on the organic nervous system, depressing its functions, such as the nutrition of the body, circulation of the blood, and the number of the red blood corpuscles." Attention was called to the bad digestion, disorders of circulation, benumbed intelligence, and clouded memory following its excessive use. Other well known authority was quoted in confirmation." After the conclusion of Dr. Bigelow's remarks, Dr. Stonehouse mentioned a case of acute mania produced by excessive tobacco smoking, and relieved by cutting it off. Many such cases could be quoted, but suffice it to say that this is not a solitary case. If tobacco in excess can produce such terrible symptoms, we ought to use it very carefully and be exceedingly cautious not to go to excess. One word about cigarette smoking. The Philadelphia *Times* has discussed this vice so well, that I will only say that cigarette smoking is more injurious than any other form of smoking tobacco; that is to say, when you use the American made cigarettes sold in the stores, because both the tobacco and paper contain impurities that are even more injurious than pure tobacco. In conclusion, I will again remind you that *excess* is the greatest foe to longevity, and that if you do not experience any of the symptoms detailed, you are not using tobacco to an extent to constitute excess in your particular case. But, if any of these signs are present (no matter how slight they may be) you are using too much; and I must further add that, in my opinion, at least, there is

no healthy man who would not be better off if he did not use tobacco at all. These same remarks will apply in the main to the filthy and ungentlemanly habit of chewing tobacco. The *Christian Secretary* contained a very amusing paragraph on tobacco, which I will give in full:—

“TOBACCO. *A Parable.*—Then shall the kingdom of Satan be likened to a grain of tobacco seed; which, though exceeding small, being cast into the ground, grew and became a great plant, and spread its leaves, rank and broad, so that huge and vile worms formed a habitation thereon. And it came to pass, in the course of time, that the sons of man looked upon it, and thought it beautiful to look upon, and much to be desired to make lads look big and manly. So they did put forth their hands and did chew thereof. And some it made sick, and others to vomit most filthily. And it further came to pass that those who chewed it became weak and unmanly, and said we are enslaved, and cannot cease from chewing it. And the mouths of all that were enslaved became foul; and they were seized with a violent spitting; and they did spit, even in ladies’ parlors, and in the house of the *Lord of Hosts*. And the saints of the *Most High* were greatly plagued thereby. And in the course of time it also came to pass that others snuffed it; and they were taken suddenly with fits, and they did sneeze with a great and mighty sneeze, insomuch that their eyes were filled with tears, and they did look exceedingly silly. And yet others cunningly wrought the leaves thereof into rolls, and did set fire to the one end thereof, and did suck vehemently at the other end thereof and did look very grave,

and calf-like ; and the smoke of their torment ascended up forever and forever. And the cultivation thereof became a great and mighty business in the earth ; and the merchant-men waxed rich by the commerce thereof. And it came to pass that the Saints of the *Most High* defiled themselves therewith ; even the poor, who could not buy shoes, nor bread, nor books for their little ones, spent their money for it. And the Lord was greatly displeased therewith, and said : ‘ Wherefore this waste ; and why do these little ones lack bread, and shoes, and books ? Turn now your fields into corn and wheat ; and put this evil thing far from you ; and be separate, and defile not yourselves any more ; and I will bless you and cause my face to shine upon you.’ But with one accord, they all exclaimed : ‘ *We* cannot cease from chewing, snuffing and puffing ; we are slaves.’ ”

CHAPTER XIV.

WHY WE OUGHT NOT TO USE ALCOHOL.

Since more disease is caused, directly or indirectly, by the use of alcohol, and since there are so many collateral evils resulting from its use, I will go into this question at some length.

If I had my own way, and could conduct the world on my own ideal plan, I would begin by banishing alcohol from the face of the earth. This seems like very strong language; wait awhile, and hear me further. This chapter is not intended to be a temperance lecture; so, my old toper friend, you can read it through without fear of having your sensibilities wounded by ranting temperance talk, or pen pictures of the horrible results of drunkenness. I have nothing to do with the moral points involved in the alcohol question. I intend only to give you a few plain, intelligible facts concerning its use, with the reasons why these facts are facts. Why would you banish alcohol from the earth? asks our moderate friend, who daily enjoys his glass or two of good wine, and would feel lost without his *night-cap*, and fondly believes that he is better for it. Because, my dear sir, if you will take the trouble to inquire for yourself, or if not, will accept my word for it, I will tell you that the physical harm done by alcohol so far overbalances the good which it does (which good can be obtained as satisfactorily from other and less dangerous agents) that if alcohol was unknown the univer-

sal health of the people of the world would be much better and the duration of life be much lengthened. Dr. Carpenter, the eminent physiologist of England, in the preface to his essay on *Alcohol*, says: "He (the author) cannot allow it (the essay) to go forth, however, without expressing his conviction that while there are adequate medical reasons for abstinence from the habitual use of even a *moderate* quantity of alcoholic liquors, there are also strong moral grounds for abstinence from that *occasional* use of them which is too frequently thought to be requisite for social enjoyment, and to form an essential part of the rites of hospitality. The experience of every practitioner must bring the terrible results of intemperance frequently before his eyes; but while he is thus rendered familiar with its consequences as regards individuals, few, save those who have expressly inquired into the subject, have any idea of the extent of the social evils resulting from it, or of the degree in which they press upon every member of the community. The author believes that he is justified in the assertion that among those who have thus inquired there is but one opinion as to the fact that of all the causes which are at present conspiring to degrade the *physical*, moral and intellectual condition of the mass of the people, there is not one to be compared in potency with the abuse of alcoholic liquors; and that if this could be done away with, the removal of all other causes would be immeasurably promoted." Further on, the same author says: "*Nothing short of total abstinence* can prevent the continuance in the rising generation of the terrible evils which we have at present to deplore." The same dis-

tinguished gentleman, in concluding his preface, states that the following certificate has been signed by upward of two thousand physicians, practicing among all classes of society, from the highest to the lowest :—

“We, the undersigned, are of opinion—

“1. That a very large proportion of human misery, including poverty, *disease* and crime, is induced by the use of alcoholic or fermented liquors as beverages.

“2. That the most perfect health is compatible with total abstinence from all such intoxicating beverages, whether in the form of ardent spirits, or as wine, beer, ale, porter, cider, etc., etc.

“3. That persons accustomed to such drinks may, with perfect safety, discontinue them entirely, either at once or gradually after a short time.

“4. That total and universal abstinence from alcoholic beverages of all sorts would greatly contribute to the health, the prosperity, the morality and the happiness of the human race.”

I know that many of you are prepared to doubt all this, but before I have finished this chapter, I will tell you some things (which you may or may not already know), which, causing you to meditate on the subject, will finally convince you that I am right.

Most non-professional persons only see the ill effects of indulgence in alcohol when a man dies of delirium tremens, or is rendered insane, or in some way disgraced by excessive indulgence in it. They do not realize, for they do not know, as the physician does, what a hydra-headed monster it is, and how infinitely numerous are the ramifications of its effects throughout the system. I can safely say that thousands die annu-

ally, before their time, sooner than necessary, indirectly from the use of alcohol, and no one, outside of the doctor, realizes it, attributing their deaths to natural causes. True enough, they do die of natural causes, so called, but these natural causes are oftentimes produced by the use of alcohol, and if the unfortunate individual had let it alone, he would, according to all scientific laws and experience, have lived a longer life. It was ascertained that during the year 1876 one-tenth of the entire mortality in England resulted from alcoholic excess.* Before detailing its evil effects, let me for a moment classify alcohol and put it where it belongs.

In small doses alcohol is a general stimulant, and in large quantities or frequently repeated smaller ones, this stimulating effect soon gives way to one of depression, while, if the quantity be sufficiently large, a condition of stupor is produced, from which it is impossible to arouse the *victim*, until the effects of the alcohol have worn off by its removal from the system. The condition of drunkenness in all its stages is that of poisoning. Now, do you know, or has it ever occurred to you, that the effects of the dangerous drugs, chloroform, ether and opium, are precisely the same. They are all, at first, stimulants, and subsequently sedatives. Now, for one minute, ask yourself if you would not consider a man a fit subject for a lunatic asylum, who would make a practice of daily drinking a certain quantity of these dangerous drugs. Their poisonous effects on his system and their power of shortening life are no greater than alcohol, when taken in proportionate quantities.

* Healthy Life and Healthy Homes.—Wilson.

Nearly all of us turn with horror from the occasional man, whom we hear has sunk so low as to drink alcohol in its pure state, when he cannot obtain whisky; and, yet the only advantage which I can see that alcoholic liquors possess over opium, chloroform, ether or pure alcohol, lies in the fact that in process of manufacture they have been rendered more palatable. Would we eat *rotten beef*, rendered palatable in cooking, if we knew it to be rotten? So let us put alcohol where it belongs, on the druggist's shelf, in a blue bottle, alongside of chloroform and ether, and label it POISON, to be sold only on physicians' prescription, and go on to the business of this chapter, the effects, good and *bad*, of alcohol.

Let us start where alcohol begins its journey, and follow it from the mouth into the stomach; what does it do there? You all know, who have used it, that alcohol is irritating; it *bites* the mouth and throat; it does precisely the same thing with the delicate coating of the stomach; like mustard applied to the skin, it causes an extra amount of blood to flow into the vessels of the lining of the stomach; and it is this excess of blood that causes the sensation of warmth in the stomach produced by drinking a glass of spirits.

All through this work I am trying to impress upon you the important fact that any kind of excess is injurious, so this excessive amount of blood in your stomach will work you harm. At first, this condition is only temporary, but by repeated use of the agent a chronic condition of engorgement is set up; that is to say, there is always *too much* blood in the walls of the stomach. This irritation also causes the gastric juice

(which is the chemical agent provided by the walls of the stomach to dissolve and digest our food) to be poured into the cavity of the stomach in excessive quantity (excess again, mind you), and a balance of this juice remaining in the stomach after all the food has been digested, and being idle, looks around for something to do, and actually turns upon the coats of the stomach and irritates and injures them. Again, it is a well-established physiological fact, and one which common sense will make apparent to all, that when vessels are filled to their utmost extent, they are incapable of holding any more, hence, these vessels in the walls of the stomach, which, properly acting, should take up the products of digestion and carry them to nourish the system at large, are so engorged with blood as to be unable to do so, when, as a natural consequence, a large portion of that which was intended to repair the wear and tear of our bodies is unable to get inside of us, and much valuable nourishment is thus unwillingly forced out of our stomachs and wasted. Let me warn you that your feelings are no indication of the amount of damage done to the stomach, as the following interesting case will demonstrate:—

Some years ago a man called Alexis St. Martin received an injury to his abdomen, which resulted in a permanent opening from the exterior of the body to his stomach, by means of which all the phenomena occurring in that organ could be observed by an outsider. Dr. Beaumont has put on record that after St. Martin had freely used ardent spirits for eight or ten days, he could perceive his stomach to be in a very unhealthy

condition, the surface of it being red and spotted with ulcers, the gastric fluids were poor in quality and mixed with a thick, ropy, gluey material, while from the little ulcers a foul matter, mixed with blood, resembling that which passes from the bowels in dysentery, was given out. And yet, he notes that "*St. Martin complains of no pain, nor shows symptoms of general indisposition ; says he feels well, and has a good appetite.*" He adds that "*the free use of ardent spirits, wine, beer, or any intoxicating liquor, when continued for some days, has invariably produced these morbid changes.*"

Stop a minute and reflect what alcohol has already done, before it has fairly entered your system, because your stomach, being but a prolongation of your mouth and throat, is really on the outside of your body proper. Having done all the harm it could in the stomach, the alcohol is absorbed from this organ and fairly starts on its journey of destruction.

Almost with the rapidity of lightning it rushes to the brain, for which organ it seems to have a peculiar love, like the affection of a false friend, who seeks your company but to do you harm. Most of its effects on this organ are so well known to all that it is unnecessary for me to detail them ; I will, however, tell you of a few, about which, most likely, you are ignorant. Many persons die of apoplexy. Apoplexy is a rupture or giving way of a blood vessel in the brain, allowing the escape of blood into the tissue of this organ. It will seem very plain when I tell you that this rupture occurs at a point in a vessel where it is abnormally weak, hence unable to withstand the pressure of the current of blood forced against it by the powerfully acting

heart. It will appear equally clear, when I tell you that the constant and long continued use of alcohol causes an excessive development and retention of fat in the system, and that particles of this fat, carried through the system and deposited in the walls of the blood vessels of the brain, taking the place of the naturally strong and resisting wall, will render it weak. So, you see one of the *natural* causes of death accounted for by alcohol. I do not mean that all cases of apoplexy are due to the use of alcohol, not by any means, but many of them are.

Again, alcohol is, as I have said, at first stimulating to the brain; it causes an excess of blood to flow into it, and by constant repetition the vessels become permanently enlarged, exerting an injurious pressure on the brain tissue and interfering with its functions. When the stupor comes on, the vessels are filled with a dark, unhealthy and poisoned blood, and so this most important organ receives poisoned food. You must remember that all your tissues and organs are fed from the blood. When the pathologist wishes to preserve a brain for future investigation, he places it in alcohol, which has the effect of hardening it, and when death occurs from alcoholic poisoning, the substance of the brain is usually white and firm, as though it had been preserved in alcohol. Now, reasoning from these facts, can any one say that alcohol may not produce the same effect on the living brain; and in pity's name, tell me, who can live and work properly with a *tough* and *hardened* brain?

Yet, more, it is a well established fact that all diseases of the brain which are not purely of a consti-

tutional character (that is to say, diseases in which the whole system is involved), are much more common among habitual drinkers than among the temperate. Every one has heard of, and even the greatest drinkers have a terrible dread of, delirium tremens, but let me tell you that a form of mental disorder of the same character, only somewhat less in degree, marked by trembling of the hands and feet, and occasional illusions, will sometimes afflict the habitually moderate drinker, who has *never* in his life reached the point of intoxication. In this connection, I will tell you something startling, that will make you open your eyes with wonder: Statistics, carefully kept, tell us, beyond doubt, that from $\frac{1}{3}$ to $\frac{1}{2}$ of the cases of insanity confined in asylums are caused directly or indirectly by intemperance.

Let us go back to the stomach, and follow the alcohol from there into the lungs, which it reaches by means of the circulation. The blood in circulating throughout the system not only gives nourishment to the various organs and tissues, but it also picks up the dead particles as it goes along, which are no longer of any use, and carries them to the different organs whose function it is to eliminate them from the blood and throw them out of the body. Prominent among these organs are the lungs. The blood charged with dead material rushes into them, where it is purified, as it were, by fire; the oxygen in the air which we take into our lungs causing a combustion or burning to take place (by the union of the oxygen with the carbon of the dead tissue) which removes from the blood many of its dead and decayed elements (which are thrown

out in expiration) and renders it once more pure and fit to start again on its journey of nourishment. Suppose this blood, when passing through the walls of the stomach, has taken up a quantity of alcohol and carries it into the lungs; see what will occur: Alcohol loves oxygen; it greedily rushes forward and seizes it all, which it appropriates to its own uses; so you can anticipate what now happens. The decayed tissue in the blood finding no oxygen to remove it, must remain where it is, hence the poor blood leaves the lungs as impure and poisoned as it came, and goes its weary rounds again, carrying poisoned blood to all the organs of the body, and contaminating everything which it touches. Here really lies one of the most evil effects of alcohol; any one can readily understand how utterly impossible it will be for his organs to hold together and properly perform their delicate and varied functions when nourished so poorly. We realize how necessary it is to eat plenty of nourishing food to sustain life, but we do not stop to think that this food which we take is rendered unfit to fulfill its mission in the blood by the presence of this contaminating alcohol. To realize what I have said, notice how soon the smell of alcohol can be detected in the breath after it has been taken into an empty stomach (the vessels absorb more rapidly when the stomach is empty), thus showing its presence in the lungs, while its great affinity for the oxygen is due to the fact that it is very rich in carbon, and that these two elements have a great attraction for each other.

Going back again to the stomach, our starting point, let us follow alcohol from there into the liver, that large

and important organ. Dr. Carpenter, already quoted, says, "*That habitual excess in the use of alcoholic liquors must have a direct tendency to produce certain diseases of the liver, will be questioned by no one who considers their mode of introduction into the system, and their influence on the condition of the blood.*" At first (as everywhere else), alcohol causes a congestion, an excess of blood in the liver. This is subsequently followed by a contraction, a diminution in size and an alteration of its structure. What are the results? They are obvious. The liver is unable to remove its quota of useless elements from the blood, while the poor blood is obliged to retain still more poison. It is one of the functions of the liver to remove from the blood some of the same ingredients which are thrown out in expiration from the lungs; now, as I have shown you, the lungs cannot act properly when alcohol contaminates them, so, extra work is thrown upon the liver, which eventually becomes fatigued, from over-exertion, and succumbs to disease. The liver contracting down on the large blood vessels that circulate through it, interferes with the free passage of that fluid, and damming it up, so to speak, exerting a backward pressure, and being opposed by the onward pressure of the heart's action, between the two opposing forces the watery constituents of the blood are forced slowly out through the porous walls of the vessels, and we have in time abdominal dropsy, an accumulation of water in the cavity of the belly. Another *natural* cause of death accounted for by alcohol. Still further, this excessive retention of fat, to which I have referred, will cause more trouble. Carried in the circulation, it seeks a place to rest; a par-

ticle settles in the strong, muscular wall of the heart, then another, and another, until, ultimately, we have a fatty heart, which, being much weakened by the presence of this poor substitute for its former strong and stout muscular fibre, becomes unable to effectually resist the backward pressure of the mass of blood which it endeavors to force out of its cavities (a pressure very great indeed), and all of a sudden it ruptures or gives way, in some weak spot, just as the vessel in the brain does, and instant death ensues. Or we may have the slower death produced so often by fatty degeneration of the heart. Still further, when by the use of alcohol we cause the retention of too much fat in the system, this fat must deposit somewhere. Hence, we can and do have at times, fatty degeneration of any or every organ in the body. Fatty degeneration of an organ, of which you hear so much, means nothing more nor less than the substitution of fat for the normal tissue of an organ, and since it is requisite for each organ to possess its own peculiar tissue in order that it may perform its own peculiar function, and since fat cannot perform any of these functions, does it not seem as plain and clear as daylight, that when, instead of its natural tissue, fat enters too largely into the composition of an organ, such organ cannot properly and fully do its duty, and that, necessarily, life must be shortened, since its prolongation is dependent upon the integrity not of one or two, but of all the organs.

The effects of alcohol on the nervous system are all too manifest, in the trembling of the drunkard and the unsteady arm and hand of the moderate drinker. What does it do here? As elsewhere, it congests the

nervous centres, causes them to receive poor nourishment, probably hardens their tissue, and hence interferes with their proper functions. Humboldt has proved, by experiment, that when a nerve is immersed in alcohol, its excitability, that is to say, its life, was at first increased, but if left for some time in this fluid, it was completely exhausted.

I might go on indefinitely, as long as the list of human organs would last, and point out to you the bad effects of alcohol on each of them. But do you not think I have said enough to show you that the use of this article is, to say the least, dangerous, if all I have said about it be true, and for the truth of my statements I can refer you, without fear of contradiction, to any intelligent physician.

Of course, I realize, as well as any one, the uselessness of writing against the use of alcohol. From all time the nations of the world have thirsted for some artificial stimulus, and have not rested till they found it; if not alcohol, something else. Still this is no argument in its favor. Its antiquity is no recommendation for it. *Sin* is very ancient, yet it is not wholesome. It is the duty of our profession to point out to our fellow creatures what they ought and what they ought not to do, in order that they may possess life, health, and consequently happiness on this earth; when we do this, and use all the moral suasion of which we are capable, our mission has been fulfilled. The accomplishment of our indications must rest with the individual, since no laws or physical force seem capable of making human nature do what it does not want to do. How often do you hear a man say, "*I do not drink*

whisky. I confine myself to beer." Deluded individual, let me tell you that you make a distinction with hardly a difference, and that only a difference of quantity and not of kind. The deleterious agent, alcohol, exists in beer as well as in whisky, and if you drink enough of it you will take into your system just as much alcohol. Men who confine themselves to the moderate use of beer and malt liquors *seem* to enjoy exceptionally good health and to be capable of great physical exertion; but this is really only a *seeming*; watch them for a time, and you will find that they break down prematurely, and experience proves that they succumb much more readily to diseases of an inflammatory nature, because the tone of the system has been so lowered that they lack vital strength to withstand them. As an illustration of this fact, let me quote from Dr. Carpenter (page 67): "The nurses in the cholera hospital at Manchester were at first worked six hours (during an epidemic), and allowed to go home the other six, *and the mortality was so great among them* that there were fears of the failure of the supply. It was found, however, that they were *much given to alcoholic potations* during their leisure hours; and they were therefore confined to the hospital, and debarred from obtaining more than a small allowance of alcoholic drink, *after which not a single fresh case occurred among them.*"

The Creator of the world has given us a most beautiful place to reside in, and has surrounded us with numerous sources of pleasure and amusement. At the same time, as though to remind us that unalloyed happiness is not intended for us here, and to make us aspire to a higher existence, he has placed or

permitted to exist among us certain evils, which, continually before us, make us yearn for a higher and a purer life, where we fondly hope they will be unknown. Prominently among these evils I would place alcohol. Reasoning from the experience of past centuries, I am forced to think that as long as human life lasts, so long will our complete happiness be interfered with by the existence of alcohol or some similar poison. Wise legislation, moral suasion and example, may serve, as it no doubt does, to keep its use within certain bounds, but will never entirely eradicate it. Hence, I deem it wise, in the remaining portion of this chapter, to call medical research and experience to my aid in pointing out to you the least hurtful use of alcohol.

In the first place, let me caution young persons to beware of the first glass. Like all the unnecessary things in this world, before we use alcohol we care but little or nothing for it; but with most persons the first drink creates a thirst for the second, and in a short time, probably the most difficult habit to break becomes established. Therefore, young persons, beware, and think well before you take the first drop. Many young men, but little more than boys, seem to think that it makes men of them to drink, and so they commence this habit, through a false idea of manliness, when they really have no desire for it. Let them remember that in many cases, instead of making *men* it makes beasts and fools of them. Occasionally, but very rarely, I have heard men advanced into the middle stage of life declare that they had never tasted alcohol in their lives. It was a pleasure to note with what an expression of pride and self-contentment they made this state-

ment; and they had reason to congratulate themselves, for they had avoided an evil that but few men in a million ever escape.

Think, young man, when at seventeen you are tempted to take your first glass of spirits, how proud and happy you will feel at forty, if you can truthfully deny all knowledge of the taste of alcohol.

Let me warn you all, but especially young men, against a disease of which I imagine you have never heard, namely *Dipsomania* or *Oinomania*. This disease, according to Dr. Hutchinson, is characterized by an irresistible propensity to swallow stimulants, in enormous doses, whenever and wherever they can be found. When you take your first drink, you have planted the seed of this terrible disease, and in many cases, unless its fertility is soon destroyed, it will germinate and develop into a well marked case of the disease, defying all the efforts of yourself and your friends to overcome it, and terminating only with your life. Many of you no doubt will immediately be able to recall an instance of this disease among your friends or acquaintances. Of all diseases, it is probably the most terrible, not only destroying the body, but dooming the mind to a living death while life lasts. The pangs of conscience and the physical sufferings of the body during the intervals of self-consciousness surely must equal the tortures of the damned; to say nothing of the business and domestic misfortunes this life of semi-imbecility must entail. Now, young men, a word more to you, about which let me beg you to meditate. I will not say much on this subject, only give you a few *facts* to think over; if you have intelligence and good

judgment, and desire to do right, it will cause you to think, and that I am sure will be sufficient; if you have not, all the eloquence of Demosthenes would not move you.

*Plutarch says, "*One drunkard begets another;*" and Aristotle adds, "*Drunken women bring forth children like unto themselves.*" Dr. Howe, in a report to the legislature of Massachusetts, says, "*The habits of the parents of 300 of the idiots were learned, and 145, or nearly one-half, are reported to be known as habitual drunkards.*" Again, "*The parents of case No. 62 were drunkards, and had SEVEN IDIOTIC CHILDREN.*" These facts I believe to be as true as gospel. No one who has passed a period in the lying-in wards of a large municipal hospital, where many of the patients come from the very lowest grades of society, and the offspring are mainly the results of intemperance and vice, will for an instant question them. Remember, that many of you will in all probability become fathers in course of time, and as you read, study by heart, and firmly fix in your minds, and keep ever before you, the four dismal facts I have given you, and let their knowledge act as a lever to root out of your system the seed of that terrible disease I have told you about. Physically, this poison is more particularly injurious to the young and growing organism, for the evident reason that the body, when in process of formation and development, is more susceptible to impressions of all kinds, good or bad, than when, further advanced in life, it becomes more settled. Therefore, I would desire in an especial manner to

* Carpenter on Alcoholic Liquors, page 49.

prohibit the use of alcohol before the age of twenty-five years. If young persons will drink, I would urge them to confine themselves to beer, ale and light wines, in moderate quantity, letting the more ardent spirits, brandy, whisky, gin, and the like, absolutely alone. They will thus suffer the minimum of harm.

Let me condemn in the strongest terms the habit so common among a certain class of Germans, of giving beer to their little children; it may make them fat and rosy, and for the time apparently healthy, but in the long run it will redound to their physical injury, to say nothing of the evil effects of inculcating a taste for it.

We will now for a moment study the chemical effects of alcohol on the constituents of the blood itself. An ingredient called *fibrin*, which is very essential to the formation of healthy tissue, is so affected by alcohol as to lessen its coagulability, its ability to become hard and firm, hence it cannot take its proper place in its normal condition in the tissues. To make this familiar, notice how much slower a wound heals in an intemperate man than in one who does not use alcohol. This is due to the lowered tone of the fibrin and other elements of the blood. The blood contains an infinite number of small disks, called red corpuscles, which play an important part in nutrition; now, when touched by alcohol, they shrink and shrivel up, while some of their contents ooze out; so you can see that they must be unfit to perform their intended duty in the body. Still further: the different dead and worthless particles which should have been discarded by the different organs if they had acted properly, remaining in the blood, finally accumulate in such immense

quantities, that it becomes almost a mechanical necessity for them to get out of it in some manner, so they force their way through the walls of the blood vessels into the muscles and joints, and we have the swellings and tortures of rheumatism and gout. Finally, a most important function of the blood is interfered with. Nothing occurs in this world by chance, there is a cause for everything. We have in our bodies what are called involuntary muscles, that is to say, muscles which act independently of the will, when we sleep as well as when we are awake, and over which we have no control. The heart is the best illustration of this, constantly and regularly contracting and relaxing, only to contract again; our will has not the slightest control over it, though its action is affected by emotions or other nervous influences. There are many other muscles concerned in carrying on the business of life, which are similar to the heart in this respect. Now, these muscles must receive their power to move, their life, from some source; they cannot move of themselves. This comes from the central office, the brain and nervous centres, which originate the power and distribute it to the various muscles, through the agency of the human telegraph wires, the nerves. Now, the nervous centres must, in the first place, receive their power of originating before they can issue their commands. This power they receive from the oxygen in the blood; so you anticipate me, that if alcohol deprives the blood of its oxygen, the nervous centres not receiving their proper incentive to action, must execute their work but poorly.

It is a mistake, as many suppose, that alcohol augments the powers of the system to withstand the

evil effects of heat and cold and other depressing influences; by blunting the powers of perception, it makes us think that we are less affected by these deleterious agents, while in reality (all medical research and experience proves this), by lowering the tone of the general system, it allows them to do greater harm. To be just, I must admit that the combination of alcohol with oxygen, about which I have told you, does produce a great amount of heat, more, in fact, than is produced by the natural process, just as the burning of an alcohol lamp will give more heat than the combustion of oil will. Hence, alcohol may prove beneficial to tide over a short period of excessive cold, when a sufficient amount of heat-producing food cannot be had, but its continued use for this purpose can only do harm.

Some persons consider small doses of alcohol a good tonic; such an opinion is erroneously based on a temporary benefit derived from its use. A tonic is something that increases the general tone of the system; now, alcohol, by its stimulating power, *seems* to do this, while in reality it is vitiating the system, as evidenced in the subsequent depression. Some persons, with a leaning toward fatalism, will likely contend that the fact of the desire for alcohol being so universal is argument in favor of its beneficial effects, when properly used. Is not this desire rather one of the temptations which the Almighty Creator has allowed to be placed before us. When some persons ascend a great height they feel an almost irresistible desire to throw themselves down; this desire is no indication that it would be well for them to do so.

Owing to want of space, I must confine myself to the statement that I can produce countless instances, both of individuals and of large bodies of men, who have clearly demonstrated their ability to perform great physical labor in a high temperature with less exhaustion and detriment to health when they did not, than when they did, use alcohol.

It has been determined by much observation that the amount of alcohol which can be daily consumed by the average man without *apparent* (mind you, *apparent*) detriment must not exceed $1\frac{1}{2}$ ounces. This is equivalent to about—

Weak beer,	-	-	-	-	-	-	-	-	2½ pints.
Ale,	-	-	-	-	-	-	-	-	1½ "
Claret,	-	-	-	-	-	-	-	-	¾ "
Sherry or port, less than	-	-	-	-	-	-	-	-	½ "
Spirituuous liquors,	-	-	-	-	-	-	-	-	3 ounces.

Port, sherry and Madeira are very apt to disorder digestion and predispose to or excite gout. Be careful to avoid acidity in beer. A physician of large experience has remarked that, * "There is no more fruitful source of gout, rheumatism, diseased heart, dropsy, and the consequent early death of the robust working man, than this beer, just on the turn and ready to become thick vinegar in the stomach."

I have now told you plainly what alcohol can, and in the majority of cases will, do to the body of man. It rests with each individual to decide whether or not he will incur this risk. Of course, alcohol will be more injurious to some than to others; therefore, in this, as in other questions, every man must be a law unto himself. I can give you the absolute rules that guide the action

* Healthy Life.—Wilson; page 150.

of alcohol on the body, but no one can tell just how much or how little any particular individual will be affected, except by experience of such particular case. But I can tell you, beyond any possibility of doubt, that there never has and never will be a perfectly healthy man whose life has been prolonged or whose health has been improved by the use of alcohol.

When there are two sides to a question, it is but just that they should both be presented, and when I find some good in alcohol, in the estimation of so high an authority as Dr. H. C. Wood, Professor of Materia Medica in the University of Pennsylvania, it behooves me to give it to you. Dr. Wood says, "That in many cases of illness, and in those periods of life when by reason of age the body waxes weak, alcohol is possessed of great virtues." He believes the moderate employment of stimulants is very useful to individuals past the age of sixty years. In the later years of life even the narcotic influence of alcohol is of great value, easing the restlessness due to slight discomforts, and the suffering of nerve failure incident to failing vitality. In chronic diseases, malt liquors have both their advantages and disadvantages. They represent food and drink, are less apt to be abused than are stronger liquids, and by virtue of their bitterness, have some tonic properties. The tendency to grossness seen in beer drinkers undoubtedly largely depends upon the solid constituents of the beer which is taken, and seems to indicate the proper medical use of malt liquors, viz.: that they are especially to be employed in wasting diseases, *i. e.*, where there is a tendency to the loss of the bodily fat. As the malt liquors contain nutritive

material, it is less necessary to give food with them than it is with whisky or wines.

In conclusion, I will give you the opinions of some eminent medical men on the use of alcohol.

Dr. N. S. Davis, the famous physician of Chicago, says: "Alcohol is an *anæsthetic*" (an agent calculated to produce unconsciousness), "directly diminishing nervous sensibility, and lessening the natural changes constituting nutrition and waste, and as it produces these effects in proportion to the quantity taken, it cannot but be *more or less injurious*, when taken in any quantity whatsoever, by persons in health. I think actual investigation has fully shown that both tobacco and alcohol, when habitually used, even in moderation, do lessen both mental and physical energy, and shorten the duration of life."

Dr. Roswell Park, of the same city, says, "I think the greatest risk in the use of either" (tobacco or alcohol), "is that he who indulges will be led rather to increase than decrease the daily allowance, and thus to use them immoderately. In cases where constitutions seem intolerant, I think they do positive harm. I can conceive of no permanent benefit to health to be obtained by use of either of the *drugs*. On the contrary, I consider that the effort to establish tolerance is, *for the time being*, a tax on the health. It is only in cases of special privation or hardship that I think a person *needs* alcohol, and tobacco one *never needs*, as proved by the fact that its first effects on one unaccustomed to it are poisonous. In general terms, while I cannot practice without using alcohol, considering it sometimes as a positive food, and again as a medicinal

agent, I think any one in health can always do just as well without either of the drugs as he possibly can with them."

Dr. R. L. Rea says: "Many persons live to extreme age and use both, but where they are healthy, *it is in spite of, and not because of the use of either.* Alcohol I believe to be a valuable medicine, but I rarely prescribe it, especially for men, for fear of replacing the disease by a worse one."

Dr. J. S. Jewell, and Dr. Bannister, of Chicago, say: "The *moderate* use of alcohol is probably not injurious to many healthy persons. The danger is in the difficulty of preserving moderation, in the true sense, and this is sufficiently great to make total abstinence the only perfectly safe rule. We have seen persons who *seemed* to be better for a little alcohol at meals or in the evening, but we could not call them healthy persons; in every case it was a sort of medicine. The habit of using either tobacco or alcohol is apt to become intensified, and moderation so easily and imperceptibly passes into the immoderate use, that we think medical advice ought to be against these agents. The fact that some cases are benefited by alcohol is no reason for advising its habitual use, even in moderation."

I could go on indefinitely, giving you opinions of the same tenor, which I have received from medical men, but they would be tiresome. These few will suffice, when I tell you that they all express virtually the same views. While they recognize that alcohol may, in some cases, prove beneficial, yet they all claim that it proves injurious in such a large majority of cases, and that its use is

so apt to grow imperceptibly into *abuse*, that they universally advise against its indulgence in health at all.

HOW TO BREAK THE ALCOHOL HABIT.

There will be many of my readers, no doubt, who will, after perusing this chapter, be anxious to give up the use of alcohol, yet will fear that because they have indulged in it for many years it will be injurious for them to do so. For the comfort of such, I will say, remember what Dr. Carpenter has been quoted to have said, in the early part of this chapter.

Believe me, that even the most inveterate drunkards can absolutely abandon the use of alcohol, without detriment to health. They will have terrible feelings for awhile, but their strength of will must be brought into play, to bridge over this terrible time until the forces of nature have once more asserted their sway and enabled their various organs to perform their duty, without the aid of artificial stimulants.

I once knew a gentleman who for years was a very heavy drinker. On his way home from business, every evening, for more than twenty years, he was in the habit of stopping in taverns with friends, and managed to get drunk every night before he reached home. Getting up in the morning, feeling terribly, he would consume several cocktails before he was fit for anything.

Finally, one morning, after he had been particularly drunk the night before, he stopped at one of his usual haunts on the way down town, and ordered a *very strong* cocktail; as he was about to drink it, the thought came suddenly into his mind: "*I have ruined my life for twenty years with alcohol. I will never drink an-*

other drop." Going home, he sent for his brother-in-law, who was a physician, and told him that he had made up his mind to renounce alcohol forever, and wanted some medicine to settle his nerves. The doctor laughed at him, and said, "Why! you will die without liquor;" "all right," was the reply, "If I do, I will die sober." This man told me that for two or three months his life was a torture to him; still, he adhered to his resolution. By degrees he commenced to feel all right, and now for more than twelve years he has not tasted liquor, neither does he crave it. What he has done, all can do.

Make up your mind that you will not drink. Use the power of will the *Almighty* has given you, and allow no temptation to swerve you from your purpose. Take my word for it, you will all enjoy better health in the long run, and have much more pleasure in life, without, than with the use of alcohol.

There can be no *half-way* business about breaking the alcohol habit. The idea of *cutting down*, of gradually reducing the quantity used, has been tried over and over again, and has, in the majority of cases, only resulted in failure, and in a consequent increase of quantity used, on account of the spirit of desperation, born of repeated failures.

So much has been written on alcohol; its evils have been so repeatedly pointed out, and yet it is so generally used, that I fear my arguments and words will carry but little weight. Therefore, I will not longer weary you. I have told you plainly what alcohol will do; you must decide for yourself whether or not, knowing these facts, you will use it.

But one more thing I must tell you again.

If you decide to give up the use of this agent, after having used it freely for years, believe me there is nothing to be gained by temporizing. Make up your mind not to drink anything, and stick faithfully to your resolution.

I cannot help giving you the following case, which I quote from the *Philadelphia Times*, March 11th, 1882. My excuse for giving the name is that all the Philadelphia papers gave it publicity, and my reason for giving the case is that it offers the most potent argument for abstinence that I have ever read:—

A BRIGHT CAREER CLOSED.

One of General Sherman's Old Officers Falls a Victim of Intemperance.

“All that was mortal of General William W. Wright, a noted civil engineer, lay cold and still in Moyamensing Prison yesterday. The man had once been a hero; men had marched to death and victory under his gallant leadership. Yesterday the sun, streaming at uncertain intervals through the grated prison windows, fell upon the blotched and bloated features of a common drunkard. This man, who had fought side by side with Sherman, on the great march to the sea, died alone, in a prison cell, Thursday night. Rum had done an awful work. Wednesday night he was arrested at Third and Spruce streets, for lying drunk on the pavement. He was sent to Moyamensing Prison for twenty-four hours, by Magistrate List, but before he had served out the time he was found dead in his cell.

“General Wright's career was brilliant from the beginning. In 1848 he became connected, as civil engi-

neer, with the Pennsylvania Railroad Company, and did good service with the surveying party that ran the experimental lines over the Allegheny Mountains. In 1849 he went over to the Turtle Creek division of the road, with headquarters at Greensburg. Leaving the employ of the company in 1854, he was appointed revision engineer of the Honduras inter-oceanic railway survey, which was made by John C. Trautwine in 1857. After remaining with Trautwine until the surveys were completed, he traveled about the world until the breaking out of the war of the Rebellion, during a part of which he served as chief of the engineering corps of the Army of the Potomac, with the rank of general. He was a particular friend of General Sherman, who admired his dash and fine executive ability. In Sherman's march to the sea General Wright had command of a large force of men detailed for pioneer duty, and was often brought into close contact with guerillas and portions of the Confederate armies. With the Army of the Potomac he had special charge of the construction and protection of burned bridges, a work for which, by reason of his dashing bravery, he was especially well fitted. At the close of the war he built several large bridges and various public works. He had charge of the plans and construction of the Kansas and Missouri bridge at Leavenworth, and the bridge at Atchison, Kansas.

"Five years ago he was a candidate for Chief Engineer and Surveyor of the city, but was defeated by Samuel L. Smedley. He was connected with the De Lesseps party that visited the Isthmus of Panama, two years ago, being chosen by Count De Lesseps as the

American engineer of the expedition. When the party returned to New York it was announced that General Wright would make the principal address at a banquet given in honor of the canal scheme. When the time came for the address General Wright was not to be found. In the course of an hour word was brought to the banquet hall that the speaker of the evening was helpless, from intoxication. Since that time he had remained in obscurity, sinking lower and lower, by reason of his appetite for strong drink, until the end of the tragedy was reached, Thursday night."

Study this history by heart, and let it be your warning against the seductive evils of intemperance.

As a fitting companion to the case just related, I will furnish, in final conclusion, the following interesting case, which I extract from the *Philadelphia Times*, May 21st, 1882:—

A MURDERER'S STORY.

The Extraordinary Autobiography of a Condemned British Ruffian.

"The English papers publish a long and curious statement made by one Thomas Fury, alias Wright, alias Cort, after being found guilty, at Durham assizes, of the willful murder of a woman of ill fame, named Maria Fitzsimmons, at Sunderland, in 1869. Sentenced to fifteen years' penal servitude, for robbery and attempted murder, in Norwich, in 1879, he voluntarily accused himself of the murder of the woman Fitzsimmons. He was put on his trial and found guilty. Fury manifested the keenest anxiety to be convicted, and received the sentence of death with the utmost satisfaction. His autobiographical statement is a psychological curiosity, and not without public interest as a

contribution to the study of 'crime causes.' The following extracts give the main part of the story. He says :—

“ Although my past career, as both a thief and a liar, would not, under ordinary circumstances, entitle me to receive any credit in regard to my statements, yet as I now stand before you for the last time, as a dying, or rather a dead, man, I beg your attention to the few words I now address to you—not for my own benefit, but for your own. Every cause must have an effect, and every effect an antecedent cause, or series of causes. I stand before you now as the resultant of the forces of persuasion, example and compulsion. And Maria Fitzsimmons, whom I murdered thirteen years ago, was another of those terrific results. The injustice of the land-laws in Ireland caused my relations to join Ribbon-men, and leave their country ; and then induced my mother to come to England to meet my father. Perhaps crime is hereditary in my case—another fact to strengthen Darwin's and Huxley's theories. I do not know, nor have I heard of, but one member on either side of our family, that was not strongly addicted to drinking. My father was a drunkard. My mother was forced to become one—held down by her nearest relatives while they poured rum down her throat until she promised to be sociable. As regards myself, I know that I was raving drunk before I was eight years old, and several times before I was ten years of age. One of the reasons for giving myself up, is to get rid of that craving for drink, for which, in my case, at least, extinction is the only cure. I shall be quite reconciled to die a shameful and dishon-

orable death—in fact, feel happy—if by my fearful doom some, a few at the least, may be warned, by the dreadful example I have become, to avoid that habit while they have strength yet to resist it.

“I was early initiated into the accursed habit, and it was more fully developed during four years spent among seamen, who seem to think that drink is the summum bonum of human life. After this it was my fate to have to spend more than four years in prison. Upon my discharge, and obtaining another ship, I determined not to drink. Upon the mate offering me my share of beer I civilly declined it, receiving a storm of abuse in return, accompanied with an order to leave the ship and go ashore if I did not like to drink. Thirty miles from home, without a penny in my pocket, what was I to do? I saw the good, the evil I had to follow. I drank the beer, was praised for being a man, and the result therefrom, as if human blood had been given to a tame tiger, was that drink was all that I lived for; for this only did I work; for it I neglected my duty to myself, my mother, and my employers; for it I became again a thief, by using money entrusted to me by my shipmates; for, by and through it, I now stand before you as the murderer of a woman.

“It would only be a waste of time to detail all the other crimes I have been guilty of since February, 1869, while under the influence of drink; mostly crimes of violence. One of the effects of drink upon me is an irresistible desire to do injury, even though they may have given me no provocation. Once I threatened my mother with a knife, shame being the only cause of not executing the threat. I have been in prisons more

than thirteen years, extending over a period of eighteen years. During that time I have spoken to many hundreds of prisoners, and only met with one who had been an abstainer previous to his conviction. And if any of you have the slightest feeling of pity or commiseration for that poor unfortunate woman whom I killed in my stupid, mad, drunken fury, and for others, not only of her class, but of every other class, let me beg of you who call yourselves Englishmen to try, by will, word, act and influence, to banish those habits, tastes and customs which are the sources of so much misery, vice and crime.' "

CHAPTER XV.

HOW TO AVOID DISEASE.

This whole book has been telling you how to avoid disease; because, since all who die young must die from some unnatural cause, and therefore from disease, so all who live to old age and naturally *pass away* must have, of necessity, avoided or escaped disease; therefore, all advice that enables you to live long must necessarily teach you how to avoid disease.

But there are some diseases that require special precautions in order that you may escape them, and it is of such that I now intend to write. If you will faithfully carry out all the advice I have given, you will be very likely to escape the diseases produced by cold and change of climate, such as pneumonia, bronchitis, catarrh and the like. If you eat as you should and do not abuse alcoholic drinks, you will not suffer from inflammation of the stomach and bowels. If you will intelligently *harden* your baby, it will not be constantly catching cold on the slightest exposure.

But in addition to this long list of diseases, nearly all of which are easily preventable, and are, in the very large majority of instances, directly the fault of the individual, we have a certain class, known to the physician as *zymotic*, and to the public as *contagious* diseases, that are subject to different laws; while they are preventable, yet no *individual* effort can surely prevent them from attacking any man; they can only be held

in abeyance by the united and concerted action of the whole world. In this class, we have smallpox, diphtheria, yellow fever, scarlet fever, measles, typhoid fever, and all the so-called contagious diseases. They are called zymotic, because they are believed to be due to a process of fermentation in the blood. The poisonous germs or elements of each particular disease are taken into the body in inspiration or through the pores of the skin, and finding in the blood suitable conditions, they ferment and give rise to the characteristic features of the disease.

These germs have life, just as much so as the human body has; they possess the power of growth, development and reproduction, as the body does; and it is upon this very activity that their danger depends. Realizing this fact, you will be prepared to understand that when brought down to its original beginning or foundation, the art of or power to avoid contagious diseases rests upon either not allowing these poisonous germs to enter the body, or destroying their vitality, or so altering their nature, that they will be incapable of producing disease when they do enter.

The first consideration is to be fulfilled by avoiding these germs. This can be accomplished only in one way, namely, by isolation. By this I mean keeping far away from these poisonous elements, and keeping them far away from you. Since they are derived from the bodies of those sick with the particular disease, it is evident, and you all now know, that you must avoid such persons; this every one knows, and I need not dilate upon it. Isolation is the first and most important means of preventing the spread of contagious



HEALTH DESTROYED.

This cut represents the effects of overtaxing the mind and nervous system by sedentary avocations and too close application to business, by which the health is destroyed, the mind weakened and soured, and the man rendered feeble, irritable and unhappy.



ROBUST HEALTH.

A man who has been temperate in his habits of eating and drinking, and lived in accordance with the laws of health. One who enjoys health of body and peace of mind, and exerts a happy influence on all around him.

diseases. The second consideration, that of destroying their vitality or altering their nature, is a most important adjunct to isolation, and is to be accomplished in one way only, namely, by disinfection.

Disinfection really means *alteration*; it means a process by which poisonous elements are deprived of their toxic properties, by which they are rendered harmless. If a man is about to stick a sword into a vital portion of your body, and some one strikes his weapon, so as to break it into pieces, he really disinfects it, because he renders it powerless to injure you. So, you can understand from this seemingly far-drawn simile, that disinfectants are agents that possess the power of so altering the nature of poisonous elements that when they do enter the body they are powerless to do it harm. It matters not what the disease may be, the same process of disinfecting will be applicable to all. Some, of course, are more dangerous than others, and therefore, call for more caution, since the danger to life will be greater; as, for instance, a man will take more pains to avoid small-pox than he will to protect himself from scarlet fever; but the same measures will be equally potent to protect from all. And just here, a word of advice. It has been customary to consider scarlet fever as a trifling disease of childhood, to which all children are subject, and which parents usually consider nearly all children must have; therefore, looking upon it as a necessary evil, they are almost anxious for their little ones to have and be done with it, and they really congratulate themselves when it is over. How serious this error is, they are oftentimes called upon to realize in after life, when some grave and fatal disease, originating, as a

consequence of an attack in childhood, of scarlet fever, manifests itself. For myself, or my children, I would much rather have smallpox than scarlet fever. In the latter disease the death rate at the time is smaller than in the former; but when a man recovers from smallpox, in the majority of instances, he is well; but it is often very doubtful whether a child recovering from scarlet fever, or some other juvenile disease, has not implanted in his system the seeds of some chronic disease that will, in a few years, develop into a serious malady.

When one is getting well from scarlet fever, the outside skin peels off, leaving the under or true skin raw and unprotected; it is like the man who goes out on a cold day without the overcoat to which he has been accustomed; if great caution is not now exercised to prevent the cold air from coming into contact with this raw surface, the blood will be driven away from it, as I have already explained (because it is so very sensitive), to find a lodging in some of the internal organs, which it will congest and disease. A large number of the fatal cases of Bright's disease of the kidney have originated from want of care after scarlet fever. I would not allow a child to leave the sick-room after this disease for at least six weeks, unless I had the whole body so carefully wrapped that it would be absolutely impossible for any cold air to touch it. I would also have a thermometer hanging in the room, and would keep the temperature as nearly uniform as the greatest care would allow. At this time, the child ought to be treated as a hot-house plant, and ought not to be allowed to resume its usual life until the new skin has entirely formed. As long as you notice any scales of skin

peeling off from the body, you can conclude that the reparative process is not yet complete, and that your child is still an invalid.

To come down, now, to disinfection, which is the truest and surest way to prevent the spread of contagious diseases, I cannot possibly describe its *modus operandi* better than by quoting from the regulations of the Illinois State Board of Health, which have been published in the National Board of Health Bulletin. These rules (while furnished for smallpox) will apply to the care and management of all contagious diseases.

"The room selected for the sick should be large, easily ventilated, and as far from the living and sleeping rooms of other members of the family as it is practicable to have it. All ornaments, carpets, drapery, and articles not absolutely needed in the room should be removed. A free circulation of air from without should be admitted, both by night and by day. There is no better disinfectant than pure air. Place the bed as near as possible in the middle of the room, but care should, of course, be taken to keep the patient out of draughts;" (you know what a draught means, a current of air flowing from an inlet to an outlet). "If the room connects with others that must be occupied, lock all but one door for entrance and exit, and fasten to the door frame—top, bottom and sides—sheets of cheap cotton cloth, which must be kept wet with thymol water;" (this is made by adding one teaspoonful of spirits of thymol to half a gallon of water, and spirits of thymol is made by adding one ounce of thymol to three ounces of 85 per cent. alcohol); "or you may use a solution of chloride of zinc; two drachms of zinc to

half a gallon of water. Over the door to be used, the sheet must not be tacked at the bottom, nor along the full length of the lock side of the frame, but about five feet may be left free, to be pushed aside; this sheet, however, must be long enough to allow ten or twelve inches to lie in folds on the floor, and must also be kept wet with the disinfectant.

"All discharges from the nose and mouth of the patient should be received on rags and immediately burned, and if the disease is smallpox, the same precaution should be taken with the crusts as they fall off. Night vessels should be kept supplied with a quart or so of the copperas disinfectant, into which all discharges from the bowels, bladder and mouth should be received. To prepare this copperas disinfectant, dissolve one and one-half pounds of sulphate of iron (copperas) in one gallon of water. All spoons, dishes, etc., used in or taken from the sick-room should be put in *boiling* water at once.

"A pail or tub of the zinc disinfectant, made as follows, one and one-half pounds of sulphate zinc and three-quarters of a pound of common salt, dissolved in six gallons of water, should be kept in the sick-room, and into this all clothing, blankets, sheets, towels, etc., used about the patient or in the room should be dropped immediately after use, and before being removed from the room. They should then be well boiled, as soon as practicable.

"Not more than two persons, one of them a skillful professional nurse, if possible, should be employed in the sick-room, and their intercourse with the other members of the family, and with the public, must be as

restricted as possible. If the disease is smallpox, all attendants should be re-vaccinated before taking charge of the patient.

"In the event that it becomes necessary for an attendant to go away from the house, a complete change of clothing must be made, using such as has not been exposed to infection; the hands, face and hair should be washed in thymol water or chloride of zinc solution. Following this, free exposure to the open air should be secured before approaching any one.

"Physicians and other necessary visitors, before entering the sick-room, should put on an outer garment, closely buttoned up, and a handkerchief or wrap about the throat and neck. Such outer garment may be a linen duster or rubber overcoat; and this, together with the neck wrap, should be taken off in the open air immediately after leaving the sick-room, and either be dipped in the zinc disinfectant or hung up in an out-of-the-way place, exposed to the air, until the next visit. Safety consists in exposing to the open air every article of clothing that has been in any way subjected to the contagion.

"Whenever practicable, the precautions above described for an attendant leaving the sick-room should be observed by the physician or visitor. Doctors and clergymen may convey contagion as readily as the laity, under similar conditions; they should, therefore, take the same precautions." If the disease be smallpox, "this advice applies also to re-vaccination at the beginning of an outbreak. Several instances of physicians, and one or two of clergymen, falling victims to the disease, have already come to the attention of the

Board during the past few months. It should be remembered that, whereas the average period of incubation" (incubation means the time that elapses between the introduction of the poison and its development into the disease) "for smallpox is about twelve days; vaccination acts in from six to eight. By vaccination, therefore, one may guard against the results of an exposure, even for some days after.

"Physicians and clergymen may do much toward securing an intelligent compliance with these rules, both by precept and example, and their assistance should be invited in all cases.

"No inmate of the house, during the continuance of the disease, should venture into any public conveyance, or assemblage, or crowded building, such as a church or a school, nor after its termination, until permission is given by the attending physician. Letters must not be sent from the patient, and all mail matter from the house should first be subjected to a dry heat of 250 to 260° Fah. "So important is this precaution, that" by a recent order of Acting P. M. G. Hatton, mail matter declared to be liable to contagion may be excluded from the mails, quarantined until the prohibition is removed, and then forwarded, only after proper disinfection, under the direction of the medical authorities.

"Domestic animals, dogs, cats, etc., should not be allowed to enter the room of the patient; or, better still, should be excluded from the house. The privy should be thoroughly disinfected during the entire illness, with the copperas disinfectant, three to five gallons of which should be thrown into the vault every three or four days. Water-closets should be disinfected

by pouring a quart or so of this disinfectant into the receiver after each use.

"After recovery has taken place, the patient should be bathed daily, for three or four days, in a weak disinfectant—the thymol water, or a solution of chloride of zinc (two drachms to half a gallon of water)." If smallpox has been the disease, "the head should be thoroughly shampooed during each bath, and the convalescent be then clothed in fresh, clean garments that have been in no way exposed to the infected air." Smallpox patients should be kept in the house at least two weeks after the crusts have all disappeared.

"After recovery or death, all articles worn by or that have come in contact with the patient, together with the room and all its contents, should be thoroughly disinfected by burning sulphur. To do this, have all windows, fire-places, flues, keyholes, doors, and other openings securely closed by strips or sheets of paper pasted over them. Then place on the hearth or stove, or on bricks set in a wash-tub containing an inch or so of water, an iron vessel of live coals, upon which throw three or four pounds of sulphur. All articles in the room, and others of every description that have been exposed to infection, which cannot be washed or exposed to dry heat, and yet are too valuable to be burned, must be spread out on chairs, or racks; mattresses or bed-springs set up so as to have both surfaces exposed; window-shades and curtains laid out at full length, and every effort made to secure thorough exposure to the sulphur fumes. The room should then be kept tightly closed for twenty-four hours. After this fumigation—which it will do no harm to repeat—the floor and wood-

work should be washed with soap and hot water, and the walls and ceiling whitewashed, or, if papered, the paper should be removed. The articles which have been subjected to fumigation should be exposed for several days to sunshine and fresh air. If the carpet has unavoidably been allowed to remain on the floor during the illness, it should not be removed until after the fumigation; but must then be taken up, beaten and shaken in the open air, and allowed to remain out of doors for a week or more. If not too valuable, it should be destroyed; but whenever practicable, it should be removed from the room at the beginning of the illness. After the above treatment has been thoroughly enforced, the doors and windows of the room should be kept open as much as possible for a week or two. Where houses are isolated, articles may be exposed out of doors. The entire contents of the house should be subjected to the greatest care, and when there is any doubt as to the safety of an article it should be destroyed, preferably, by burning.

“Such articles of clothing, bedding, etc., as can be washed, should first be treated by dipping in the zinc disinfectant; they should then be immediately and thoroughly boiled.

“The ticking of beds and pillows used by the patient should be treated in the same manner, and the contents, if hair or feathers, should be thoroughly baked in an oven. If this cannot be done, they should be destroyed by fire, as should, in any event, all straw, husk, moss or ‘excelsior’ filling. The clothing of nurses should be thoroughly fumigated and cleansed before they are taken from the house, or better still, burned, if feasible.

“In this connection attention is called to the fact that smallpox has been conveyed between widely distant points, during this epidemic, through the medium of rags and paper stock. In the present emergency authorities will do well to quarantine shipments of these articles unless accompanied by a certificate of their disinfection under competent supervision. In any event, it is incumbent upon owners of establishments in which such articles are handled to insist upon the vaccination or re-vaccination of all persons engaged in the work.”

While the above rules were issued to prevent the spread of smallpox, yet they are so applicable to all contagious diseases that I felt I could not do better than quote them in full.

By observing these precautions carefully, it will be almost impossible for any disease to spread, and the danger of contagion will be confined to those in immediate attendance on the patient, while even there it will be reduced to the minimum.

But some persons die of contagious diseases, and while we know that in some diseases the poison can be received from the dead body, we have not sufficient grounds to say that it *may* not be so communicable in all diseases. Therefore, certain disinfecting precautions are necessary in the cases of those who die from contagious diseases. From the source that I have already quoted, I note that “In the event of death (from smallpox) the clothing in which the body is attired should be sprinkled with thymol water, the body wrapped in a disinfectant cerecloth (a sheet thoroughly soaked in the zinc disinfectant, double

strength) and placed in an air-tight coffin, which is to remain in the sick-room until removed for burial. No public funeral must be allowed, either at the house or at the church, and no more persons should be permitted to go to the cemetery than are necessary to inter the corpse."

While these very stringent regulations may seem unnecessary, and almost to partake of the character of unnatural harshness toward the remains of one who has, mayhap, been very much beloved in life, yet I can assure you that the nearer you adhere to them, in the case of all contagious diseases, the less likely will others be to take the disease.

To point this, I will relate a case that recently happened in England. A young man, employed as porter at one of the railway stations in London, fell sick with diphtheria and died. His body was removed, for interment, to a neighboring village where he belonged, and where there lived a young woman to whom he was engaged to be married. The coffin lid was removed, to allow his friends to view the remains, and this young woman kissed his mouth. A few days subsequently she was seized with diphtheria and died.

A communication from Dr. Jenkins, recently published in the *Medical and Surgical Reporter*, will convey to your minds better than could be done in any other way, the necessity for this thorough disinfection, because it will make you realize for how long a time these poisonous germs may retain their activity unless deprived of it by disinfection. He says, "I was called on February 9th, 1882, to see Philip M., a child two years old, in consultation with Dr. Payne. The dis-

case was decided to be scarlet fever. The child died on the thirteenth day of the disease. The source of infection seemed obscure, and the parents insisted that the child had been nowhere to catch the disease. It was the only child in the family; had not been away from home; there were no cases in that part of the city, and only three mild cases anywhere in the community, and in those, contagion was easily established as a cause. We ascertained the fact that they had lost a child two years before, with scarlet fever, and that the child was just the same age as this little fellow.

"This led us to think that probably some of the clothing might have been laid away without having been disinfected, and saved until this child had reached the same age, and then put upon him. Upon inquiry, we were told that the child had worn none of his brother's clothing recently. When we called next day, however, the mother exhibited a little woolen cap, and said that this was the only article of clothing that the child had worn recently that had belonged to his brother. After further investigation, we found that the child that died two years before had this cap on when he was taken sick, that it hung in the room during his illness, and that after the funeral it was put away in a closely covered tin box without disinfecting. The box was airtight, and the cap had never been out of it until three days before our little patient was taken sick, when he wore it out on the street. Both Dr. Payne and myself were fully satisfied, from the above circumstances, that the scarlet fever germs had been kept in that cap for two years. Why might it not, under the same careful process, be kept for ten years?"

It would be impossible for any one book to contain all the small details necessary to prevent the inroads of disease. I can but point out the main indications, and by so doing give you a nucleus from which your intelligence must evolve the whole.

Man must realize that, in connection with the subject of avoiding disease, he has certain duties that he owes to the public, to his neighbors, as well as to himself and his family.

He must ever remember the golden rule of "Do unto others as you would that they should do unto you." It is very well, of course, to use all precautions to prevent contracting disease, but you must not be entirely selfish; you must at the same time exert yourself to prevent the spread of contagious diseases, and to save others from suffering the afflictions you are so anxious and so solicitous to avoid yourselves. Very few persons realize their true duties and position in this world. In politics, the very large majority of men take little or no interest; they do an immense deal of talking, but it all ends in talk; they do not act, because they feel that there are others to do the work; they have their own private interests to look after, and feel disinclined to spare the time for public labor; when, as a logical sequence, the administration of the affairs of government, from the smallest village to the capital of the nation, falls into the hands of men who make politics the business of their lives. When a man goes into any kind of mercantile business, whether it be manufacturing or trading, he is resolved to make all the money he can; and while he makes a great parade of honesty, yet, from my experience in the world, there

are very few large business men who will not often strain points amazingly, and resort to practices that, while they cannot be exactly characterized as absolutely dishonest, yet are of such a nature that a *perfectly* pure-minded man would recoil from their perpetration. So it is with professional politicians. The majority of them commence poor; they embark in politics, as a man commences in other business, with the purpose of making money, and they are not overly particular how they make it; in their selfish way of looking at it, "the end justifies the means."

They even *strain points* to a greater extent than the average merchant, and they are enabled to do so because of the apathy and indifference of their neighbors.

Contagious diseases might be aptly compared to average politicians. They both thrive by oppressing and afflicting human nature. They start from the same hot-house of corruption, and intend to secure all the prizes possible. To the politician, power and money; to the disease, victims, deformity and death. Here are the two *Meccas*, toward which each direct their ultimate ends.

Contagious diseases have no business in the world; they ought not to exist; neither have professional politicians; they are both blots on the bright page of humanity, but they both are, because of the indifference of the large mass of mankind.

If a man owns real estate, from which he derives a rental of fifty thousand dollars a year, it makes very little difference to him how much corruption may exist in municipal government. Even though the numerous *jobs* and political chicanery may double the tax rate,

it will make such a comparatively small extra demand on his large income, that he fails to bestir himself to disinfect this mass of political rottenness, because it does not seriously affect him in purse. If this same man can keep disease away from his own house and his own family, it is all right, in his estimation ; he cares not how many others may suffer ; he thinks that every man ought to take care of himself, and fails to realize the duties he owes to his neighbors.

But, unfortunately, disease is not quite so politic or discriminating as our corruptionists. They fear and respect *money*, disease does not. They cannot seriously injure a very rich man ; disease can ; it can kill him. It makes no difference to disease, whether a man is a millionaire or a pauper ; it has no preferences, neither does it know fear. It respects and avoids and fears only one class of human beings, namely, those who know how to live, those who understand hygiene and put its teachings into practice.

Occasionally we hear of an era of reform, when the better men of a locality unite together to crush and exterminate the professional politicians who have been preying on their vitals (their purses), and whose corruption has become unbearable. To accomplish their purpose, they use all possible means to arouse the public from their lethargy, to make them realize how they are being robbed and abused, and to show them how easy it will be to overthrow these *robber bosses*, if they will only rise in their power and use the energies which they possess. When a reform victory has been achieved, the warriors, if they reflect, are themselves surprised how easy the *machine* has been

defeated, and wonder why they tolerated such oppression so long. So it is, precisely, with disease.

The Boards of Health are the reform committees, who are banded together to combat and overthrow disease. Realizing that disease, in its various forms, was undermining and destroying the physical welfare of man, just as political debauchery was ruining the foundation of theoretical popular government, it became one of the necessities of civilization, that men of intelligence should unite together in order that they might devise means to limit and control the hitherto unchecked ravages of disease. Out of this necessity sprang, first, the various city "Boards of Health;" then came similar bodies for the States; and finally it was deemed wise to establish a "*National Board of Health.*" But just as it would be impossible for any reform committee of citizens, no matter how much wealth and intelligence might be represented, and no matter how hard they might work, to overthrow a corrupt municipal or State *ring*, unless they could enlist not only the sympathy, but also the active and hearty coöperation of the masses, so will it be equally impossible for any board or boards of health to vanquish disease, unless they are thoroughly aided by the intelligent assistance of the public.

The reform committee tells you how to purify politics, and to politically destroy bad rulers. But you must do the work. Boards of Health instruct you how you may avoid disease, and how you may successfully battle with and ultimately annihilate contagion, but you must carry out their instructions, otherwise their labor will be of no avail.

This crude illustration will serve to make you understand how essential it is for the public to assist heartily the efforts of organized Boards, and how futile their efforts will be if they do not receive this full coöperation. You all know that the purpose for which a Board of Health is created is to devise means to prevent disease and to promote the public health; you will now know equally well that the Board cannot do this alone; that it can do nothing of any account, unless you aid its efforts.

It may issue directions for certain things to be done, but if you fail to carry out these suggestions, their recommendations will be of no avail and might as well not have been made. They will tell you what to do, but you must do it.

In order that you may understand your duties in this respect, I will make some quotations from the sanitary laws of various localities, as I find them recorded in the National Board of Health Bulletin. It will be your duty to assist, as far as lies in your power, the carrying out of these regulations. How to do so, the minute details, I will not insult your intelligence by detailing. Your good, common sense will make clear to you the means by which you can assist the local authorities. But ever bear in mind, that when you are aiding others to avoid disease, you are likewise taking precautions for yourself, because no one can say *where* and when disease may break out.

First we will note some of the sanitary laws of *Terre Haute, Indiana*. After establishing a board of health, the Council ordinance goes on to say:—

GENERAL DUTIES OF THE BOARD OF HEALTH.

"The Board of Health, hereby established, shall have general supervision of the sanitary condition of the city, and is hereby invested with power to establish and enforce such rules and regulations as they may deem necessary to promote, preserve and secure the health of the city, and to prevent the introduction and spreading of contagious, infectious, or pestilential diseases. The Board of Health, or any member thereof, is empowered and authorized to enter any premises for the purpose of examining the sanitary condition thereof. It is hereby enjoined upon the officers of the city to be attentive and vigilant in assisting the Board of Health in the execution of their duties.

"Immediately after their organization the Board shall appoint one of their number to act as a health officer.

DUTIES OF THE HEALTH OFFICER.

"It shall be the duty of the health officer to execute and enforce, by the aid of the sanitary police hereinafter to be provided for, the orders and directions of the Board of Health, and the provisions of all ordinances touching the health of the city, to examine and inspect all places and sources of filth which may be, or are likely to become, nuisances, and report the same to the Board of Health, in order that they may be removed or abated, and to suggest to the Board, at all times, such hygienic (disease preventing) measures as he may deem necessary to promote the health and comfort of the city.

SANITARY POLICE.

"The Police Board may, in their discretion, with the

concurrence of the Common Council, appoint sanitary policemen, who shall act in aid of and under the direction of the Board of Health, in enforcing the provisions of this ordinance and the regulations and rules of the Board of Health.

DUTIES OF THE SANITARY POLICE.

“It shall be the duty of the police to aid the health officers in executing and enforcing the orders and directions of the Board of Health, and in enforcing all ordinances and laws designed to promote and secure the healthfulness of the city. It shall be the duty of each policeman to patrol his district thoroughly and systematically. When a policeman finds any person violating any of the ordinances relating to public health, it shall be his duty to inform such person of such violation, and report the same to the health officer. It shall be the duty of the city marshal to serve all notices issued by the Board of Health, and report to the health officer whether the notices served have been complied with or not. It shall be the duty of any policeman, under the direction of any health officer, to file complaint against such persons as persistently violate any of the directions of the Board of Health or any of the provisions of the sanitary ordinance.

PHYSICIANS AND OTHERS TO REPORT DISEASES.

“For the purpose of guarding against the introduction and spreading of any contagious, infectious or pestilential diseases, it shall be the duty hereafter, of all physicians, of all keepers of hotels, taverns or boarding-houses, or of any householder, to report in writing to the Board of Health, or some member thereof, forthwith, each and

every case which may come to their knowledge, of *smallpox, diphtheria, scarlet fever, typhoid fever, cholera*, or any other pestilential disease, occurring or existing within the limits or vicinity of said city, including in such report the name of person so afflicted, and the place where such person may be found.

DUTIES OF THE BOARD OF HEALTH IN CASE OF CONTAGIOUS
DISEASES.

“Whenever any person shall report to the Board of Health, or any member thereof, that any person within the corporate limits of said city is affected with or suffering from *smallpox, diphtheria, scarlet fever, cholera*, or any other pestilential disease, it shall be the duty of said Board of Health, or some member thereof, forthwith to examine the condition of the person so reported, and if it shall be found that such person is afflicted with and suffering from any such disease, said Board of Health, or some member thereof, shall at once take such steps as may be necessary to *isolate* such person, and if they deem it necessary, shall cause such person to be removed to some suitable place or building prepared for such cases. And whenever *smallpox, diphtheria, scarlet fever*, or any other pestilential disease is found to exist in any house or tenement, to cause its presence to be indicated by a red flag bearing the name of the disease in white letters. And it shall be the duty of the Board of Health to see that suitable disinfectants are properly used, and to promptly enforce all such measures as they may deem necessary to secure and promote the public health. And it shall be the duty of the Board of Health to investigate, as far as possible, the causes of such contagious

and pestilential disease, and if possible, remove or abate such causes.

IN CASE OF RECOVERY FROM A CONTAGIOUS DISEASE.

"It shall be unlawful for any person who has become affected with any contagious or infectious disease, or who is recovering from such disease, to attend school, church, or any public gathering, or to mingle in society in any way, until the Board of Health, or some person designated by them, certifies that they are no longer liable to communicate said disease.

IN CASE OF DEATH FROM A CONTAGIOUS DISEASE.

"It shall be unlawful to hold a public funeral for any person who has died of cholera, smallpox, diphtheria or scarlet fever.

CERTIFICATE OF DEATHS BY PHYSICIANS.

"It shall be the duty of the physician to immediately furnish to the family in which may occur the death of any person upon whom he has been in professional attendance, without charge, a certificate, setting forth, as nearly as may be known, the following facts in relation to such deceased person; viz., the age, name, sex, color, nativity, whether married or single, date and cause of death, and late residence. And in case no physician shall have been in attendance, then such certificate shall be furnished to the undertaker by some member of the family of the deceased, or by some other person, who may have been in attendance upon such deceased person during his or her last sickness. In case of a Coroner's inquest, such certificate shall be furnished, without charge, by the Coroner.

BURIAL PERMITS.

"It shall be the duty of the Board of Health, on the

presentation of a certificate of death, as provided in the preceding section, to file the same and issue thereon a burial permit, and it shall be unlawful to bury any person in any of the cemeteries of Terre Haute without a permit from the Board of Health, issued on the presentation of a certificate of death.

CONSTRUCTION OF PRIVY VAULTS.

"All privy vaults hereafter constructed or reconstructed within the city limits shall be sunk to a depth of not less than ten or more than fifteen feet, and be walled up with brick or stone. Each privy vault should be provided with a ventilating flue, extending from the vault to a distance of at least two feet above the building over the vault.

LOCATION OF CESSPOOLS.

"It shall be unlawful to construct any cesspool within twenty-five feet of any well, the water from which is used for drinking or culinary purposes, unless said cesspool be made water-tight. Whenever any cesspool has already been constructed within less than twenty-five feet from such well, the same shall, within two months from the time this ordinance takes effect, be emptied of its contents and filled with earth.

DISINFECTING PRIVY VAULTS AND CESSPOOLS.

"It shall be unlawful to permit any privy vault or cesspool within the corporate limits of Terre Haute to become filled to within less than two feet of the surface of the ground. All privy vaults must be deodorized and disinfected with lime, sulphate of iron (copperas), ashes, earth, or some other disinfectant, that they shall emit no noxious gases or offensive odors.

CLEANING PRIVY VAULTS AND CESSPOOLS.

"It shall hereafter be unlawful for any person, firm or company to empty any privy vault, cesspool or other receptacle of fluid filth, except with a machine, or apparatus, or by a process approved by the Board of Health, which approval must be evidenced by a written certificate issued to the person, firm or company proposing to engage in said business, by the Secretary of the Board of Health, which certificate shall be granted without charge. When a privy vault or cesspool emits offensive odors, or becomes too full, or needs reconstruction, the owner, occupant, or agent of the premises shall disinfect, or clean and disinfect, or clean and reconstruct, within five days after receiving a written or printed notice so to do from the Board of Health. If said notice is not complied with, it shall be the duty of said Board to employ some person or persons to execute their order, at the expense of said occupant, owner or agent.

VAULT-CLEANERS' APPARATUS.

"It shall be unlawful for any firm, person, or company, using or controlling any wagon, machine or other apparatus for emptying privy vaults or cesspools, etc., to allow such apparatus to remain or stand upon any street, alley, lot, or other place in said city, unless the same has been thoroughly cleansed and deodorized since last used.

DISPOSAL OF FILTH FROM VAULTS AND CESSPOOLS.

"It shall be unlawful for any person or firm to empty or deposit the contents of any cesspool, water-closet, privy vault, or sink, or any offal, garbage, manure, or any refuse vegetable or animal matter,

in any place other than that selected by the Board of Health.

DEPOSITING FILTH IN ALLEYS, AREAS, ETC.

“It shall be unlawful for any person or persons to deposit or place any offal, garbage, manure, or any kind of refuse animal or vegetable matter that may give rise to noxious gases or offensive odors, in any alley, street, yard, or in any public or private grounds in said city, but the same shall be placed in water-tight receptacles, which shall be kept in some convenient and secure place on the premises, to be removed as often as may be necessary to prevent the formation of noxious gases or offensive odors.

ALLOWING FILTH TO REMAIN IN ALLEYS.

“It shall be unlawful for any person or persons to allow any accumulation of filth that may be detrimental to the health or comfort of the city, in any yard or alley, or on any premises which such person may own, occupy, or for which he may be the agent.

CLEANING FOUL ALLEYS, ETC.

“It shall be the duty of the Board of Health, whenever they find any accumulation of filth which may be detrimental to the health or comfort of the city, in any yard or alley, or on any premises, to issue a written or printed notice to the owner, occupant or agent of said premises, to clean the same within three days; and if said owner, occupant or agent shall fail to comply with said notice, then the Board of Health shall issue a notice to the Street Commissioner, who shall forthwith clean said premises, at the expense of the owner thereof.

FLUSHING AND CLEANING SEWERS.

"It shall be the duty of the Fire Department to thoroughly flush and cleanse the sewers of the city as often as the Board of Health may deem necessary to promote, preserve and secure the health of the city.

CONSTRUCTION OF WELLS.

"In order, hereafter, to prevent contamination of wells, be it enacted, that all wells hereafter dug shall be so constructed as to prevent surface water from draining into them; and no pools of stagnant water shall be allowed to form or remain near them, and all public wells shall be securely arched over with brick or stone, and cemented.

PUBLIC WELLS.

"It shall be unlawful to maintain any public well in the city, unless it be provided with a water-tight catch basin, which empties through an iron pipe into a drain-well, at least fifteen feet deep, and at least twenty feet from the said public well. Such drain-well to be securely arched over with brick or stone.

SLAUGHTER-HOUSES, ETC., WITHIN THE CITY LIMITS.

"It shall be unlawful for any person, firm or company to erect, build or construct within the limits of the city any greasery, soap factory, tallow chandlery, tannery, slaughter-house, distillery, or any other building or inclosure, for the purpose of carrying on any business or trade which may give rise to noxious gases or offensive odors.

CONSTRUCTION AND CARE OF SLAUGHTER-HOUSES.

"It shall be unlawful to use or occupy as a slaughter-house, any house, pen, yard or other place within the corporate limits of the city, or within two miles thereof,

unless such house, pen, yard, or other place be paved with brick, stone or tiling, and cemented so as to be water-tight, and the said pavement made with descent toward a gutter, which shall pass through the same, and lead to a tub or reservoir, placed so as to receive the blood and offal. And the whole of such pavement, gutter and reservoir shall be thoroughly cleaned at the end of each day the same is used during the months of March, April, May, June, July, August, September and October, and at least once each week during the months of November, December, January and February, and every such slaughter-house or pen shall be whitewashed with lime once every month during the year. And the occupant of such slaughter-house shall not permit or suffer to remain on or about such premises any blood, offal, bones, hair, slop, or any offensive matter, for a longer period than twenty-four hours, between the first of April and the first of November of each year, nor longer than one week during the remainder of the year, but the same shall be collected and removed in tight-covered vessels, and buried, or so disposed of as not to give rise to any offensive odors or noxious gases, and such person shall at all times keep his premises in a clean and proper sanitary condition.

INSPECTION OF SLAUGHTER-HOUSES, BUTCHER-SHOPS, ETC.

“It shall be the duty of the Board of Health to inspect all slaughter-houses, butcher-shops, and fish markets, and to require that they be kept clean and in good sanitary condition; to inspect meat and fish offered for sale, and if any be found that is unwholesome and unfit for use, to condemn the same, and prohibit its sale for food.

INSPECTION OF DAIRIES AND MILK.

"It shall be the duty of the Board of Health, as often as they may deem necessary, to inspect dairies, and to require them to be kept in good sanitary condition, and to inspect the milk offered for sale, and if any be found unwholesome and unfit for use, to condemn the same and prohibit its sale for use.

STABLES, PIG-PENS, HEN-HOUSES, ETC.

"It shall be unlawful to erect or build any stable, pig-pen, hen-house, or any building for the keeping of domestic animals, within twenty-five feet of any well the water from which is used for domestic purposes, and it shall be unlawful to allow any stable, shed, house, pen, or any inclosure in which domestic animals are kept, to become filthy, or to emit noxious gases or offensive odors.

COOPER VATS.

"It shall be unlawful to construct any cooper vats within the corporate limits of the city, except in such a manner and in such locality as may be approved by the Board of Health. And all cooper vats now in use within the city limits shall be emptied and cleaned as often as the Board may deem necessary for the health of the city."

The Board of Health of Richmond, Va., published the following card:—

HOW TO SUPPRESS SMALLPOX.

OFFICE BOARD OF HEALTH,

RICHMOND, December 27, 1881.

"The most effectual way is to secure the hearty and intelligent coöperation of the heads of families, managers of all manufacturing interests, merchants, super-

intendents of transportation lines—indeed, all who have others in their employment—to carry out the views of the Council as expressed in the recent order on this subject. To accomplish this result, such responsible persons must see that no one in their employment is unprotected (by vaccination). In case of refusal, they should report the subordinate, and then discharge him promptly from their service, refusing to employ any one who is not protected by vaccination. It would be well for householders and others to satisfy themselves as to the possibility of introducing the disease into their families from receiving their clothing of laundresses of whose surroundings they know nothing. Smallpox has been conveyed in clothing returned from an infected place. Under the wise and beneficial provisions of this ordinance our citizens have an opportunity of protecting themselves in the manner above indicated. If any one will not yield preconceived views on the subject of vaccination and revaccination, he had better seek a habitation, as a hermit, elsewhere. The authorities intend that the ordinance shall be enforced, as they believe that no one has the right to make himself a centre of contagion and death to the whole community, even if he *is* willing to incur the personal risk himself.”

(Signed) J. L. CABELL,

President Board of Health.

The State Board of Health of Indiana has issued the following: “After January 1st, 1882, no person, until after they have been successfully vaccinated, shall be admitted into any public or private school in the State.”

From New Hampshire, under date of December 19th, 1881, I note that “Its appearance (smallpox)

within the State would be a great misfortune, for the panic it is sure to cause paralyzes business within a certain radius, and entails large pecuniary loss to all within the municipal limits of its infection. The only safety is in vaccination and re-vaccination as a preventive, and isolation, if, unfortunately, it gains a foothold. It is important, therefore, that railway officials guard closely against the transportation of those having the disease, or who have been in such position as to have their clothing infected with the contagion; for a railway passenger car, once infected, becomes a prolific centre for the infection of others, as well as a difficult and expensive apartment to disinfect and cleanse."

From Nashville, Tenn., we hear as follows:—

NASHVILLE TENN., January 4, 1882.

*"To Public Carriers:—*Smallpox being reported prevalent in several of the leading cities of the country, and recently having developed in two localities in Tennessee, through the agency of persons coming from other States, in order to prevent the spread of the disease, the State Board of Health orders—

"1st. That no person suspected of having smallpox, in any of its forms, shall be allowed to travel on railroad, water way, or other means of public conveyance in the State, and all common carriers are hereby interdicted from transporting any such persons.

"2d. That no corpse having died of smallpox or other infectious disease shall be transported under fifteen months after death, and then only with a temperature of 32° or under, and upon a certificate of the health officer at the place of disinterment and re-interment, if any there be.

"3d. That no goods, or chattels, or merchandise, or wearing apparel belonging or pertaining to any person infected with smallpox, or which may have been exposed to such infection, shall be received on board of any train, steamboat, barge, or other public conveyance, for transportation to any point within the State or elsewhere.

"4th. No passenger or goods of any description shall be received by any line of public carriers, for transportation, without the certificate of an inspector recognized by the Board, if there is reason to believe that such passenger or goods have been exposed to infection." (Signed) W. M. CLARK, M.D.,

Secretary and Executive Officer State Board of Health.

The following are the OHIO STATE LAWS:—

"The owner, or agent of the owner, of a house in which a person resides who has the smallpox, or any other disease dangerous to the public health, and the physician called to attend the person so afflicted, shall, within twenty-four hours after becoming cognizant of the fact, give notice thereof to the Board of Health, and when a person so affected is removed to a pest-house or hospital, the Board of Health is empowered to use all necessary means to restrain him of his liberty until the danger from infection or contagion from such disease ceases.

"Railroads, vessels, etc., may be subjected to quarantine. The Board of Health or health officer may, in time of epidemics, or threatened epidemics, establish a quarantine on vessels, railroads, or any class of vehicles used for the purpose of transporting passengers, baggage or freight.

“ A person removed to a pest-house or hospital, who wilfully leaves or escapes therefrom, before the physician thereof issues a certificate of restored health, shall be fined not less than five nor more than fifty dollars, or imprisoned not less than one nor more than ten days.

“ Whoever violates any provision of this chapter, or any order of the Board of Health made in pursuance thereof, or obstructs and interferes with the execution of any such order, or wilfully and illegally omits to obey any such order, shall be fined in any sum not exceeding one hundred dollars, or imprisoned for any time not exceeding ninety days, or both.”

Still further, the Common Council of the city of Cincinnati have ordained “ That whenever a case of small-pox is found within the limits of the city, the Board of Police Commissioners, or the health officer, are hereby authorized and empowered to exercise complete supervision over such case, so far as to prescribe the number of attendants or nurses, or persons who shall be allowed access to the apartment occupied by the person so afflicted ; and it shall be the duty of said health authorities to so restrict the movements of those nursing or in communication with smallpox patients that said persons may be restrained from going about promiscuously among the citizens.

“ The Board of Health and health officer are also hereby authorized and directed to prohibit all sale or disposition of rags, clothing, bedding, carpets, or furniture to dealers or other parties, from dwellings in which any smallpox patient may be or may have been, or the washing of clothing or other articles of any kind which

may have been used or exposed to infection in the apartments of such patients, elsewhere than in said dwelling, until the same shall have been disinfected in a manner satisfactory to the health officer.

"It shall be the duty of every captain, or commanding officer of any steamboat or other vessel that may arrive at the port of Cincinnati, to report at once to the health officer every case of smallpox that may have occurred or been found on board of said vessel during the voyage or after arrival.

"The making or washing of clothing, other than for the family, in any building in which there is a case of smallpox, or the conveyance of the body of any deceased smallpox patient in any public hack or carriage, are strictly forbidden. Any person or persons offending against the provisions of this ordinance shall be subject to a fine not exceeding fifty dollars, or imprisonment in the city work-house for not more than thirty days."

(Signed,) A. J. MILES, M.D.,
Health Officer.

SMALLPOX REGULATIONS AT THE PORTS OF NEW YORK AND
BOSTON.

QUARANTINE, S. I., December 24th, 1881.

*To Owners and Managers of Passenger Steamship
Lines at the Port of New York:—*

"The following rules and regulations have been adopted by the National Board of Health, and approved by the President of the United States, November 14th, 1881:—

"1. That all persons coming from or through any foreign port or place in which smallpox exists, who,

after the 14th day of November, 1881, shall arrive at any port of entry within the United States shall be subjected to examination in regard to their protection from that disease by the proper health authorities of the State within which such port lies ; or in case such authorities shall fail or refuse to enforce this rule, then by some officer or other proper person to be designated by the President of the United States.

“2. That in case any person so arriving shall refuse to submit to such examination, or upon undergoing the same shall be found not sufficiently protected from smallpox, such person, and in case he or she be not *sui juris*, then also the person having him or her under charge, shall be detained in quarantine until he or she shall have been properly vaccinated, or shall have passed the period of incubation from date of last exposure.”

Attention is also respectfully called to the following rule and regulation of the National Board of Health:—

“All merchant ships and vessels sailing from a foreign port where contagious or infectious disease exists, for any port of the United States, must obtain from the Consul, Vice Consul, or other Consular Officer of the United States at the port of departure, or from the medical officer, where such officer has been detailed by the President of the United States for that purpose, a bill of health in duplicate, which shall set forth the sanitary history of said vessel, and that it has in all respects complied with these rules and regulations.

“Believing that protection of the lives and health of the people demand the adoption of the foregoing rules and regulations, the following requirements will be

made of the officers of steamships entering this port:—

“1st. Bills of health will be required by the quarantine officials at this port, in conformity with the above regulations.

“2d. All immigrants, on arrival at quarantine, will be subjected to examination as regards their protection from smallpox.

“3d. The examination of all immigrants by the medical officers of steamships, within twenty-four hours of leaving port, and the vaccination of those who give evidence of insufficient protection through previous vaccination, will, if considered by the medical officer at quarantine to have been faithfully and intelligently performed, exempt immigrant passengers from such examination at quarantine as may be necessary to determine whether or not such passengers are protected from the effect of the contagion of smallpox, except where smallpox exists or has existed on board the vessel on the passage to this port.

“4th. A certificate or card in the hand of each passenger, or the parent or guardian of the passenger, on which shall be written or printed “PROTECTED,” and signed by the medical officer of the steamship, will be understood to indicate that such passenger is sufficiently protected by previous vaccination or through the vaccination done on shipboard. All passengers not having such certificate will be considered and treated as exposed or unprotected.

“5th. The medical officers of passenger steamships will be required to verify under oath the number of persons considered protected by vaccination and smallpox.

"6th. All persons not protected will be vaccinated or submitted to a quarantine of observation.

"The examination of such passengers as are vaccinated soon after leaving the port of departure, and shortly before entering this port, to determine results, is earnestly enjoined upon medical officers.

"Satisfactory evidence of adequate protection of immigrant passengers from previous vaccination, or thorough early vaccination by the medical officer of the ship, will not only contribute to the protection of the public health and security, but will promote the interests of passenger lines by saving time and expense at quarantine."

(Signed)

WILLIAM M. SMITH,

Health Officer, Port of New York.

The following will be of interest.

CIRCULAR TO STEAMBOAT OWNERS.

ILLINOIS STATE BOARD OF HEALTH.

OFFICE OF THE SECRETARY,

SPRINGFIELD, January 9, 1882.

"DEAR SIR: Smallpox has already been introduced (within the past six weeks) into *thirteen* of the eighteen Mississippi river counties of Illinois, as well as into the United States Marine Hospital at Cairo. In some instances the introduction is positively known to have been due to 'roustabouts' or other hands from steamboats, and in others it is strongly suspected to have been by the same means. Under these circumstances, it becomes my duty to advise you that unless those employed on steamboats are properly protected by vaccination (or otherwise), it may become necessary to enforce quarantine restrictions at all the river towns

of this State. It is earnestly hoped that such a measure may not have to be resorted to, but its avoidance rests altogether in the hands of officers of steamboat lines and their immediate subordinates. An order from such officers requiring the prompt vaccination of all those permanently employed on their boats would be the first and most important step.

"I have already written to the Surgeon General of the Marine Hospital Service, asking what provision can be made for the gratuitous vaccination of hospital-tax-paying river men, and have no doubt he will make the necessary arrangements to that end.

When this is done I would suggest that you supplement the requirements above indicated by another, directing that within a reasonable time after vaccination is thus made gratuitous, no "rouster" or deck hand be employed on your boats who does not present a certificate of recent vaccination (or other protection) from a marine hospital surgeon. Nothing impracticable nor onerous is asked or expected, but it is so entirely feasible to eliminate this mode of spreading smallpox, *i. e.*, by unprotected steamboat men and employés, and the dangers to be averted, as well as the benefits to be derived, are so numerous and so obvious, that your cordial coöperation is confidently anticipated."

Very respectfully,

(Signed) JOHN H. RAUCH, M.D., *Secretary*.

Dr. Thomas C. Minor thus writes to the National Board of Health Bulletin: "Cincinnati is again suffering from its old-time plague, smallpox. With a large number of its population bitterly opposed to vaccination, this fresh outbreak did not occur as a sanitary

surprise ; in fact, the present epidemic manifestation was confidently predicted in the report of the Health Department for 1879, at a time when the city was entirely free from the disease. That warning, however, was not heeded, and the usual consequences have followed. The winter of 1881, 1882 and 1883 will probably witness a repetition of the scenes of 1871, 1872 and 1873. Hundreds of valuable lives will be lost and much damage done to the trade of the city, in consequence of the absence of legislation making vaccination compulsory throughout the State.

“The epidemic of 1869 and 1870 cost the city over 800 lives, and left about 3000 surviving victims in a badly marked condition. The epidemic of 1871 and 1872 footed up a mortality of over 1400 in twelve months, and, estimating a death rate at 25 per cent., over 5000 persons must have suffered from the disease. Without a law making vaccination compulsory, no Board of Health can expect to check an epidemic of smallpox, and the sanitary outlook is dark and foreboding.”

PROPOSED SANITARY LEGISLATION IN MARYLAND.

A BILL, entitled, “*An act to provide against the spread of infectious diseases*”—

“SECTION 1. *Be it enacted by the General Assembly of Maryland*, that where the health authority of any city or any Justice of the Peace for any County, is of opinion, on the certificate of a qualified medical practitioner, that the cleansing or disinfecting of any house or part thereof, and of articles therein likely to retain infection, would tend to prevent or check infectious diseases, it shall be the duty of such authority or Justice of the

Peace to give notice, in writing, to the owner or occupant of such house or part thereof, requiring him or her to cleanse and disinfect such house or part thereof, and articles, within a time specified in each notice; and if the person to whom notice is so given fails to comply therewith, he or she shall be liable to a penalty of not less than five dollars and not exceeding ten dollars for every day during which he or she continues to make default: and the health authority or Justice of the Peace, as the case may be, shall cause such house, or part thereof, and articles, to be cleansed and disinfected, and may recover the expenses incurred from the owner or occupant in default, as other fines and forfeitures are recoverable; *provided*, that where the owner or occupant of any such house or part thereof is, from poverty or otherwise, unable, in the opinion of the authority or Justice of the Peace, effectually to carry out the requirements of this section, such authority or Justice of the Peace may, without enforcing such requirements on such owner or occupant, cleanse and disinfect such house or parts thereof, and articles, and the city, town or county in which such house is situated shall defray the expenses thereof.

“SEC. 2. *And be it enacted*, that any health authority in any city or town, or any Justice of the Peace for any county, may direct the disinfection or destruction of any bedding, clothing or other articles which have been exposed to infection from any dangerous infectious disease; *provided*, that where any person sustains any damage by reason of the exercise of any of the powers of this act, in relation to any matter as to which he is not himself in default, reasonable compensation shall

be made by the municipal or county authorities to such person.

"SEC. 3. *And be it enacted*, that when any suitable hospital or place for the reception of the sick is provided, within a convenient distance, any person who is suffering from any dangerous infectious disease, and is without proper lodging or accommodation, or lodged in a room occupied by more than one family, or is on board any ship or vessel, may, on a certificate signed by a qualified medical practitioner, and with the consent of the superintending body of such hospital or place, be removed, by order of any health authority, or Justice of the Peace, to such hospital or place, at the cost of the city or county in which such case may occur; and any person who willfully disobeys or obstructs the execution of such order shall be deemed guilty of a misdemeanor, and shall be fined not less than \$50, nor more than \$200, or be imprisoned in jail in the discretion of a competent court, not less than one month, nor more than six months.

"SEC. 4. *And be it enacted*, That any person who, while suffering from any dangerous infectious disorder, willfully exposes himself or herself, without proper precautions against spreading the said disorder, in any street, public place, shop, inn or public conveyance, or enters any public conveyance without previously notifying the owner, conductor, or driver thereof, that he is so suffering, or being in charge of any person so suffering, so exposes such sufferer, or gives, lends, sells, transmits or exposes, without previous thorough disinfection, any bedding, clothing, rags, or other things which have been exposed to infection from any such

disorder, shall be liable to a penalty not exceeding \$500, or imprisonment not exceeding twelve months, or both, in the discretion of a competent court.

"SEC. 5. *And be it enacted*, that any person, parent, or guardian, or other party, who carelessly carry about children, or others, affected with infectious diseases, or who knowingly, or willfully introduce infectious persons into other persons' houses, or permit children under their care to attend any school, theatre, church, or any public place where they will be brought in contact with others, shall be liable to a penalty not exceeding \$100 for each and every such offence.

"SEC. 6. *And be it enacted*, that every owner or driver of a public conveyance shall immediately provide for the disinfection of such conveyance, in a manner to be approved by the local health authorities, after it has conveyed any one suffering from a dangerous infectious disorder, or the corpse of any one who has died from any such disorder; and if he fails to do so, he shall be liable to a penalty not exceeding \$25; but no such owner or driver shall be required to convey any person so suffering until he has been paid a sum sufficient to cover any loss or expense incurred by him in carrying into effect the provisions of this section.

"SEC. 7. *And be it enacted*, that any person who knowingly lets for hire any house, room, or part of a house, in which any person has been suffering from any dangerous infectious disorder, without having such house, room, or part of a house, and all articles therein liable to retain infection, disinfected, to the satisfaction of a qualified medical practitioner, as testified by a certificate signed by him, shall be liable to a penalty

not exceeding \$250; and any person letting for hire, or showing for the purpose of letting for hire, any house, or part of house, or room, who, being questioned by any person negotiating for the hire of such house, or part of house, or room, as to the fact of there being, or within six weeks previously having been therein, any person suffering from any dangerous infectious disorder, knowingly makes a false answer to such question, shall be liable to a penalty not exceeding \$500 or to imprisonment for a period not exceeding twelve months.

"SEC. 8. *And be it enacted*, that when the body of any one who has died of any infectious disease is retained in a room in which persons live or sleep, or any dead body which is in such a state as to endanger the health of the inmates of the same house or room, any health officer or justice of the peace may, on a certificate signed by a qualified medical practitioner, or the application of three persons living in the neighborhood, order the body to be removed and buried at the expense of the city, town or county, within a time to be limited by such order; and unless the friends or relatives of the deceased undertake to bury the body within the time so limited, and do bury the same, it shall be the duty of said health officer or justice of the peace to have such body buried at the expense of the city, town or county, and any person or persons obstructing the execution of any order made by any health officer or justice of the peace, under this section, shall be liable to a penalty not exceeding \$200, or imprisonment not exceeding six months."

CIRCULAR TO PASTORS OF CHURCHES AND OTHERS.

OFFICE OF BOARD OF HEALTH,

GRAND RAPIDS, MICH., Nov. 4, 1881.

To ————:

“By virtue of authority vested in this Board, under sections 1731, 1732, and 1733 of the compiled laws of this State, we issue the following notice to all pastors of churches, sextons, hack owners, and all others who take any public part in the burial of the dead in the city of Grand Rapids:—

“All pastors of churches and sextons are prohibited from holding a public funeral in case of any person who may have died of smallpox, varioloid, diphtheria, scarlet fever, cholera, or puerperal fever, or from countenancing the holding of such funeral.

“Hack owners and livery men are prohibited from allowing the bodies of persons dead from any of the diseases named in the last clause to be carried in any hack, omnibus or other vehicle owned or controlled by them, in any manner, or for any purpose whatever.

“The penalty for the violation of any rule or regulation established by Boards of Health, under authority of the sections named, is a forfeiture by the person so offending of not less than ten dollars nor more than one hundred dollars for each offence. In the performance of its plain duty this Board has no alternative save to fulfill the requirements of the laws referred to, which, hereafter, it will endeavor strictly and impartially to do.

“Earnestly desiring to do all in our power to arrest the spread of contagious and infectious diseases, we ask your hearty coöperation in the attainment of this

object, and trust that, in the interest of humanity and for the good of our city, you will not only hasten to comply with the requirements of this notice, but will, by every means in your power, strive to arrest the progress of disease, and improve the sanitary condition of our surroundings."

(Signed)

GEO. A. LOVE,

D. J. DOORNINK,

C. H. MAXIM, M.D.,

Members of Board of Health.

SANITARY PRECAUTIONS TO PREVENT THE SPREADING OF INFECTIOUS DISEASES.

Smallpox, scarlet fever, diphtheria, or measles.—The patient should be kept in a separate room (preferably on an upper floor) from which, if possible, carpets, curtains, stuffed furniture, clothing, and other articles not required for immediate use should be removed beforehand; and no person, except the physician, nurse or parent, should be allowed to enter the sick-room, or touch any of the articles used therein, until after thorough disinfection.

To disinfect clothing, etc., in the sick-room.—Keep in the room a tub containing a quarter of a pound of sulphate of zinc and two ounces of common salt to each gallon of water. All bed-linen, towels, clothing, handkerchiefs, etc., used about the patient should be allowed to soak in this solution for at least an hour before removal from the room, and afterward be thoroughly boiled separate from the rest of the family washing. Never send such articles to a public laundry.

To disinfect discharges from the patient.—Use the same disinfecting fluid as in disinfecting clothing, but three times stronger, or use copperas water made by

dissolving a pound and a half of copperas in a gallon of water. The latter answers for all excremental discharges, while the former is best for all articles of clothing and furniture. All vessels used in the sick-room should be disinfected with one or other of these disinfecting fluids, unless immediately immersed in boiling water. Disinfect the discharges and clothing immediately.

J. R. DIBRELL, JR., M.D.,

Secretary State Board of Health, of Arkansas.

CIRCULAR NO. 52.

NATIONAL EXPRESS COMPANY,

GENERAL SUPERINTENDENT'S OFFICE,

TROY, N. Y., January 10, 1882.

"The New York State Board of Health has ordered 'that no remains of the dead from smallpox, and no materials known or suspected of having been exposed to the contagion, shall be brought to or carried into or through any railway station in the State of New York, or be transported upon any railway or by any public carrier from place to place.'

"The State Board of Health has also ordered that 'all public carriers that convey the remains of the dead over the limits of the county where the death occurred, will require a transit permit before receiving the corpse.'

"Therefore, all employés of the National Express Company, within the limits of the State of New York, must be governed by the following instructions:—

"First. Whenever bodies are offered for shipment, destined to points beyond the limits of the county where the death occurred, you will refuse to receive same unless accompanied by a transit permit issued by the local authorities.

"Second. Said transit permit must accompany body to destination.

"Third. Coupon number one, attached to transit permit, must be detached by agent at shipping office before body leaves such office or station; and the coupon must be preserved at such point, for future reference.

"Fourth. Coupon number two must be detached by agent at destination, unless the destination is a point beyond the limits of the State of New York. When such is the case, the last messenger carrying the body within the limits of the State of New York must detach the coupon (number two), and certify to that effect on the back of the transit permit. Coupons detached by messengers must be left with agents at terminus of routes, for preservation.

"Fifth. Attached is a sample of the permits required by the State Board of Health.

"Further. All employes of the National Express Company, in New York State and elsewhere, are prohibited from receiving for shipment the remains of the dead from smallpox or other contagious diseases.

"Agents outside of the State of New York will require the ordinary physician's certificate, as heretofore, before receiving bodies for shipment."

E. H. VIRGIL, *General Superintendent.*

These extensive quotations from the National Board of Health Bulletin have been made for several reasons. In the first place, to many it will demonstrate, for the first time, the purposes and uses of Health Boards. You will now know how valuable they are. Again, it will give you a very good idea of how to avoid disease;

but, more important than any other consideration, it will make clear to any thoughtful mind the utter uselessness of Health Boards and sanitary legislation, unless it is backed up by popular coöperation. You can readily see how very easy it would be for any one so inclined to avoid compliance with the rules laid down, and how very difficult it would prove, in the large majority of instances, to detect these delinquents.

While sanitarians can direct and do much to improve the health of the world by public actions, yet if they do not receive the hearty support of the people, their efforts will accomplish but limited results. What they build up, public neglect of the teachings of hygiene will raze to the ground. Contagious diseases ought not to exist. They are abnormal conditions, contrary to the pure functions and laws of nature. A man ought not to have *small* pox any more than he ought to have *big* pox; but both are contagious, and if he subjects himself to the influence of the poison, he will be very apt to contract the disease in either case. Since these conditions are abnormal, and ought not to be, we have good grounds to believe that by proper actions they might be totally annihilated from the globe. To accomplish this task would require enormous and long continued effort, but success, we have every reason to believe, would ultimately crown the labor.

To accomplish this Utopian conception, but one thing is necessary. The whole world must resolve itself into one huge Board of Health. Every man, woman and child must become a member. Not an honorary member on the retired list, but a real, live, active, energetic portion of this large board.

In other words, without interfering too much or unnecessarily with your neighbor's business, you should make it your business to see that he fulfills the indications of the Board of Health, and if you find him derelict, to make report of his failure to the Board. Be sure, however, that you yourself are faithful in their observance.

As with politics so with health, the people must do, or the *bosses* will rule, and when they rule, they do so for personal gain, and care not for the political or physical welfare of their neighbors. If any measure calculated to promote health comes before the average politician he views it through a mercenary microscope; if there is any money in it for him he is satisfied, it will receive his *public-spirited* and patriotic support; he has not looked into the matter deeply enough to know whether the proposed measure really has any merit, but that makes no difference to him if he can personally benefit himself.

It behooves every man to know what he ought to do himself and what his neighbors ought to do, in the first place, and then to see that he and his neighbors live accordingly, in order that health may be promoted and disease averted. While Boards of Health are necessary, because somebody must be clothed with legislative authority to enforce their recommendations, it will not do to sit quietly down and allow them to do everything, giving no thought to sanitary matters because you know that a Board exists whose duty it is to attend to them. A merchant would be a fool who would trust his business absolutely to another; so is a man a fool who will trust his health implicitly in the hands

of others. Did you ever hear why the hyrax has no tail? "It is written, in the mystic volume of St. Nicholas, that when the world was about being completed, notice was issued to all the beasts that, if they would go to the court of the king on a certain day, they would be handsomely finished off with tails. All were pleased with the prospect, but the hyrax was especially delighted. When the appointed day came, it was cold and rainy, and the hyrax did not like to go out in bad weather. So he stood in his door and asked the lion, and the wolf, and several others, to bring him his tail, and they all promised to attend to it. But they all forgot it, and when the hyrax went himself the next day to see about it, he found that the supply of tails was exhausted. That is why the hyrax has no tail; and if you rely on what other people tell you that they have done, or are going to do, for you, the result will probably be about the same." *

So it is with the majority of human beings. While they usually remember and do that which they realize at the time will be to their benefit, yet with public matters they are like the hyrax, they look for others to do for them that which they neglect to do for themselves, and, like the hyrax, they are generally disappointed.

Therefore, as you now understand, in order that contagious diseases may be avoided, and good health maintained, it becomes an absolute necessity that each one of us must do his or her duty in assisting the Boards of Health. If you notice any one of your neighbors neglecting any of the provisions already enunciated, or doing anything that, to your intelligent

* Address of John S. Billings, M. D.

judgment, would seem detrimental to the health of the neighborhood, do not permit any false sentiment to prevent you from reporting such dereliction, and after making your report, see that it is acted upon.

A careful observance of the different rules of life laid down throughout this work will tend to prevent, while a disregard of them will favor, the production of those diseased conditions of the human system not dependent upon contagion. The rules for disinfection will, if thoroughly carried out, destroy the power and virulence of contagious diseases. In conclusion, one word about typhoid fever. The features of this disease are located in the bowels, and it is the evacuations from them that contain the poisonous germs. This is the medium of contagion in this disease, therefore is it especially important that all stools from typhoid fever patients should be passed into a receptacle containing one of the solutions already referred to, by which they may be thoroughly disinfected.

CHAPTER XVI.

HOW AGED PERSONS OUGHT TO LIVE.

GROWING OLD.

At six—I well remember when—
I fancied all folks old at ten.

But when I'd turned my first decade,
Fifteen appeared more truly staid.

But when the fifteenth round I'd run,
I thought none old till twenty-one.

Then, oddly, when I'd reached that age,
I held that thirty made folks sage.

But when my thirtieth year was told,
I said, "At twoscore men grow old!"

Yet twoscore came and found me thrifty,
And so I drew the line at fifty.

But when I reached that age, I swore
None could be old until threescore.

And here I am at sixty now,
As young as when at six, I trow!

'Tis true my hair is somewhat gray,
And that I use a cane to-day;

'Tis true, these rogues about my knee
Say "Grandpa!" when they speak to me;

But, bless your soul, I'm young as when
I thought all people old at ten!

Perhaps a little wiser grown—
Perhaps some old illusions flown;

But wond'ring still, while years have rolled,
When is it that a man grows old?

Vandyke Brown.

As it requires special care and precautions in the management of infants, that they may grow into strong men and women, so does it become necessary that men and women shall alter to a certain extent their mode

of life, and use a certain amount of caution when they reach old age.

The reasons for this will be made obvious by a few words of explanation. In the first place, all the vital organs, after years of activity, are commencing to feel exhausted; they are not as young and vigorous as they once were; their inheritance of vital force is nearly exhausted, and unless carefully economized will not last long.

Let us suppose that when a man reaches sixty years of age he still possesses an amount of vital force that might be represented as, say 100. If, now, he uses ten portions of this force per year, it will last him ten years; but if he uses twenty, it will become exhausted in five years; and so in proportion.

In order to economize this vital force it will be necessary for old people to live *slower*, as it were, in every particular. Since the vital phenomena are more languid, the labor imposed on the vital organs must necessarily be lighter, or they will be unable to stand it. When a man has had for years a good and faithful horse, that finally grows old and infirm in his service, unless he is himself a brute, he will have consideration for the growing weaknesses of this animal, and will work him but little, allowing him to pass most of his time in ease and comfort. So ought man to treat his organs. When they have faithfully served him for sixty years or more, he ought to pension them, to place them on the retired list, and treat them with as much consideration and respect as a good young man would pay to his aged mother.

In old age all the phenomena of life are reduced in



A HAPPY AND PEACEFUL OLD AGE.

activity, all the functions are performed less rapidly and less vigorously; while in youth the process of formation or development exceeds that of destruction, and in middle life the two are equal, in old age destruction predominates and foreshadows the ultimate dissolution. Therefore, all measures must be resorted to that are calculated to retard this excessive tendency toward destruction. Such measures are those that make the least demand on the tissue, because, as you know, all acts of life entail the destruction of tissue, and the consumption of a certain amount of vital force, which will necessarily still further exhaust these already aged and weak organs. So, then, all voluntary acts must be performed more slowly and with more deliberation. The bright fire of youth has now become converted, by use and time, into the dull glow of old age; if you put on the bellows, you can make this worn-out fire take on new activity, and for a short time burn as brightly as ever, but the succeeding lowering or depression will be great in proportion to the amount of artificial activity infused into the fire; the fuel will be more rapidly consumed, and the fire will ultimately go out or die sooner than it would have done if you had let it alone and allowed it to run its own course and slowly moulder away. It would not have given out as much heat as it did when young and fresh, any more than an old man will exhibit the mental or physical activity or phenomena of his early and mature life; but it will live along, slowly nearing the end, spark after spark gradually going out, until, finally, but the last one remains, when, with a spasmodic flicker or two, it ceases to be a thing of light or heat, and all

within the hearth is black and dead. So it is precisely, or, at least, so it should be, with the human body. When old age has been reached, the period for cessation of great activity, both mental and physical, has arrived. The remaining years of life ought to be passed in quietude and repose; one ought to realize that his system will not now bear the strains and demands that were as nothing in mature life, and so realizing, ought not to impose these unbearable burdens on his organs.

Again, as old age creeps on, even in ordinarily healthy people, there takes place a peculiar degeneration of the blood vessels, known to physicians as "*atheromatous degeneration.*" A tissue, somewhat resembling fat, but more brittle and resisting, is deposited in the walls of these vessels, taking the place of the ordinary, natural muscular and elastic tissue.

This change renders the vessels less elastic, and from this very change serious results may ensue. You can realize that you can force a column of liquid two inches in diameter through a *rubber* tube that has only a diameter of one inch, because the elastic rubber will stretch; but if, instead of rubber, your tube is made of leather or some other inelastic material, and you endeavor to pass through it any body of greater diameter than itself, it will rupture. The case is identical with the blood vessels. If, when they possess their natural and healthy elasticity, any great or extra strain is made on their calibre, they can dilate and accommodate themselves to it; but when they become hard, unyielding and brittle, they will rupture on the slightest strain, and give rise to apoplexy, which really means a giving

way of a blood vessel and the consequent escape of blood into the surrounding tissue.

A very fast walk or any unusual physical exercise in an old person might so increase the force of the heart's action as to cause it to send the blood with unwonted energy against these brittle, chalky vessels, and rupture them. Any unusual exertion might make a demand upon the aged and weakened heart that it would be unable to fulfill, when, from sheer exhaustion, it would be unable to continue its labor, and death would suddenly ensue.

John Hunter, one of the greatest surgeons of modern times, died in this way. He had heart disease, and knowing it, was always careful to live an equable, quiet life, so as not to put any unnecessary strain on this organ. One day he was at a meeting of the authorities of one of the great London hospitals, when a discussion arose; he became very much interested; one of the directors made some remarks opposed to his views, and, in the course of his address, made some statements that greatly angered Hunter. When an opportunity offered, he arose, full of anger, prepared to make a most bitter speech; but he had forgotten his weakness and his caution. He was excited greatly, and so was his heart; it was acting tumultuously; he opened his mouth to speak, when he suddenly fell unconscious, and being carried into an adjoining room, expired in a few minutes. He had overtaxed his aged and weak heart by his excessive emotion, and it had given way.

Realizing, as you now must, how necessary an even, quiet, equable existence is at all periods of life,

in order that you may attain longevity, you will be fully prepared to understand that it is infinitely more important for the aged, because of the reasons already given.

Indiscretions in eating are much more liable to produce diarrhœa and dyspepsia in old persons than in those who are young, simply because, in the latter class the vital activity of the stomach and bowels is so much greater that it can more readily combat and disarm the evil results of this indiscretion.

If you have never thought of it before, after you read this chapter, notice how many more old persons die in winter (and particularly in the months of November and March), than in summer. For years these old people have been accustomed to do as they liked and when they pleased. Failing to realize what I now tell them, about all of their functions getting weaker and less active, and their vigor decreasing, they continue in this same course. Finally, on some cold blustery day in winter, venturing forth, as he or she has done for, maybe, seventy years, the frigid air strikes the chest, driving the blood from the surface into the lungs, the circulation or the blood vessels are too old and weak to drive it out again, congestion of the lungs or pneumonia follows, and the whole organization being unable to throw off or withstand the violence of the disease, death rapidly ensues.

America's great poet, Longfellow, recently met his death in this way. His organs were all moderately healthy; he was an old man, seventy-five, but it would seem that he had every right to expect to live for many years. Unfortunately, he did not realize that his aged

body was in the condition I have been describing; he failed to understand that his circulation was aged and sluggish, and very impressionable. He attended a meeting one raw night in winter, and caught cold. It settled on his *peritoneum* (a thin and very delicate and sensitive membrane that lays over and covers the bowels like an apron), *peritonitis* set in (inflammation of this membrane), and he died.

What is generally known as apoplexy, that is, a rupture of a blood vessel in the brain, occurs exceedingly rarely among young persons, but is a very common cause of death in men over sixty. The blood vessels, becoming weak by the deposit in their walls of fat, or atheroma, as I have described, any indiscretion that will cause the blood to be thrown against this weak spot with unusual force will rupture it. Thus, any violent emotion, of excessive anger, joy, or expectancy, any great exercise, mental or physical, any sudden effort, or even great straining at the water-closet, may determine apoplexy in one predisposed to it by degeneration of the blood vessels.

Realizing these facts, a great poet-physician, now over seventy years of age, living in the neighborhood of our lamented Longfellow, answering my letter of inquiry, already referred to, while refusing to allow me to use his name (which I deeply regret, since I am sure if you knew who was talking you would be much more apt to follow his example, because there is, I am confident, but very few intelligent men who have not read his beautiful literary productions and to whom his name is not as familiar almost as their own), says: "I live temperately, often drink a little beer or wine at

dinner, avoid what hurts my digestion, keep out of draughts as much as possible, dress warmly, live cleanly, use no tobacco in any form, and get along comfortably enough for one of my years." Here we have, briefly and tersely stated, the life of a man who has lived long enough and worked hard enough to secure an international reputation as a poet, a physician and a prose author.

The same rules of life will apply to old persons that I have already indicated. I could not formulate any others. An old man is formed precisely the same as a young body or a man in his prime; the only difference being that he is nearer the end of his vital resources, and therefore must conserve the vital power remaining more carefully; he must make less demands upon it and spend it more prudently.

While he must observe the same rules of life as are to be followed by his sons, he must carry them out more rigidly. One night of indiscretion may be thoroughly and completely atoned for by the young and vigorous man, while it may prove fatal to his grandfather.

Since old persons usually have more judgment and are more prone to reason, and oftentimes to receive advice, than are the young, who, unfortunately, rashly and impulsively, let instinct guide them, and foolishly imagine that they know more than their grandfathers, this will be an appropriate place to allow the aged to commune with each other; so, unlocking the drawer in which I keep my *pets* (as I love to call my correspondence from the aged men, who, were it for nothing but their great age, would be entitled to great respect),

I will here transcribe some of these valuable letters from gentlemen whose age and experience entitle their words to great consideration from all who desire to attain great longevity.

To commence, I will furnish the letter from my oldest correspondent on the ROLL OF HONOR, HENRY IMHOFF, of *Richmond, Indiana*, who has attained the wonderful age of 105 years. His relatives answer my letter of inquiry as follows; I will furnish the reply verbatim:—

RICHMOND, Nov. 17th, 1880.

DR. EDWARDS:—

Dear Sir:—In reply to your letter, we will give you a few items of grandfather's life:—

1. Born in the year 1775, on the 16th day of July, and is at present enjoying good health.

2. His mother died young, at the age of about forty.

3. His children are well and in good health.

4. He was raised in a country village, working on farms and doing general hard work. At the age of twenty-one he was enrolled in the French army of Napoleon I, and remained in the army until the period of Napoleon's downfall.

5. He has always been very temperate and very headstrong; never has been and still is not afraid of anything.

6. He has always used tobacco, chewing and smoking, and still uses it. In Germany he would always and every day take, once or twice, a drink of liquor, and this habit he still continues, although the quantity has been reduced to a very small drink.

7. He has been always accustomed to hard work, up to within the past ten years.

8. Has always enjoyed good health.

9. He has used coffee and tea for the past thirty years in this country, but in Germany he mostly drank milk and water.

10. He has always been somewhat careful of his diet; vegetable soup has been a great favorite.

11. In his younger days he was never particular about his hours for sleep; now he retires at 7 P. M. and arises at 7 A. M.

12. He has never given much thought to his health.

13. His constitution and nature was and is rough and robust. In his young days he was very strong, with coarse features, and while in Germany lived very purely. He never cared whether he worked day or night, or both. He has raised a family of nine children, all of whom enjoy good health, are of very vigorous constitution, heavily built, and of good weight.

Yours truly,

(Signed)

HENRY IMHOFF.

We have here more of a curiosity than a lesson. This venerable man no doubt inherited such an immense amount of vital force that he would have lived to old age without any care. As you can see by this letter, he has evidently never given a second thought to himself, but has lived as nature dictated, and owing to his inherent vigor has reached a great age; now, he is somewhat more careful, but this is merely because his failing strength make the performances of his earlier years impossible. Had he lived in early life as I desire to teach you to live, this exceptional man might be,

even to-day, as vigorous as an ordinary man of fifty or sixty. This good gentleman is a perfect illustration of what great hereditary vigor can do, in spite of neglect of care; but we must not draw deductions from such rare cases. They happen but seldom, and since I am trying to formulate laws for the guidance of the majority, I deem it unwise to reason from the experience of the minority. Again, we must conclude, from what Mr. Imhoff tells us, that his life has been devoted principally to physical exertion; in him we do not see that glorious medium between physical and intellectual excess that our next correspondent will furnish.

This letter comes from the honorable and venerable Eli K. Price, to whom I have already had occasion to refer.

This gentleman, who is still as active as when he wrote to me, and who seems to bid fair to live for many years, writes as follows:—

PHILADELPHIA, September 22d, 1880.

Dear Sir:—I embrace the first leisure to answer your queries under date of 15th instant.

1. My father died in his 74th year, of (2) pleurisy.
3. My mother died in her 85th year, of (4) diarrhœa.
5. I am not aware that I inherited a predisposition to any disease.
6. I was born in the country, and did farm work and rode horses, from my earliest capability until 14 years of age, getting several months' schooling each year, and then was a year at West Town boarding school continuously.
7. My temperament was sanguine and enterprising, but qualified by caution.

8. My only training was physical, but with an ardent desire to acquire knowledge, and for this I lost no opportunity.

9. *I never used alcohol or tobacco.*

10. My whole life's occupation has been *an alternation of mental and physical exercise*, desisting from the former whenever I felt it necessary, and sometimes as compelled by disease induced by prostration, from excess of application to sedentary study.

11. I have not had much sickness, but have many times been ill from excess in study, breathing bad air, with chills and fever, and summer diarrhœa. These compelled rest, which I most needed, *and my recuperations have been to a higher point of health, even to the present year, when near 83 years old*, of course, allowing for the abated strength of old age.

12. I have used, through life, coffee at breakfast, tea at tea; but this I am able to do by keeping up my physical strength.

13. I have been careful of my diet, but not dainty or fastidious; I have eaten to live with a comfortable stomach and a clear intellect, and have constantly watched these indexes. I am as watchful as to my food as is the smelter of iron that his furnace shall not chill and choke; and regulate my food to prevent constipation or laxity, rather than to resort to medicine, which I avoid using until necessary; and in illness, act in strict obedience to my chosen physician of regular graduation.

14. I go to bed soon after ten o'clock, and of recent time use the early morning light rather than the gas in the owly night. As other old persons, I am apt to

wake before day; and that I may not toss wearily, I rise, wash my face, brush my body and comb my hair. I then rest pleasantly; the chain of unpleasant dreams is broken, and often I have a sweet and refreshing morning slumber.

We groom our horses better than ourselves, as we select our stock with more care than the mothers or husbands who shall be parents of our children, to bear our names and become heirs of our estates.

As we grow older, and the circulation becomes slower, as does the digestion, we are more liable to unpleasant dreams; we need such relief, and at the same time we get *Franklin's Air Bath*.

15. My constitution was, naturally, neither robust nor delicate; I was, as a boy and young man, tall, straight and lithe; but made myself delicate, by a too studious and sedentary life; and regained my health by taking the lessons taught by experience.

16. With the exceptions already given, I have been careful of my health. I hold it to be a sacred principle, that we have no right to mar or shorten the CREATOR'S highest gift to man, his health and life; no; neither the professional nor the scientific student, nor even the religious preacher, has the right to do this. I confess to having done this at times; have been prostrated; have fallen senseless on the floor; but have generally, as far as practicable, avoided long trials in the crowded court room.

17. I give you my age, when I say I was born July 20th, 1797.

18. You ask any other information which may be of service to your work, and ask the use of my name as

an example that may influence others. As such, I would say, that I might probably have greater length of life, if I had been less laborious; and the problem of greatest longevity, I apprehend, would be better filled by one less anxiously laborious. Yet active intellectual labor and hopefulness of success are undoubtedly very important means. And here let me not take to myself merit that does not belong to me. I am largely what I am because George Fox and his associates founded, under God, the Society of Friends, and William Penn established the Colony of Pennsylvania. Two of my ancestors came with the latter, in "*The Welcome*," in his first voyage to his Province, and the first settlers of every line of my ancestry before the second voyage, or within twenty years from 1682; and these and all their generations, down to me, were Friends; and that is to say all were temperate, moral and religious, with unimpaired constitutions. Yet more, I was checked and overruled by an unseen but surely-felt power; and every illness I endured was a lesson and a blessing in disguise, but with purpose of good. I am, respectfully,

(Signed)

ELI K. PRICE.

To Dr. J. F. EDWARDS.

SECOND LETTER FROM ELI K. PRICE.

PHILADELPHIA, October, 5th, 1880.

Dear Sir:—Further reflection convinces me that I should add to the answer I have made to your inquiries. My food is always good, of easy digestion, and nourishing, though simple, taken at regular hours, dividing the day nearly equally, and all meals in moderation. I drink

pure water, breathe pure air, sleep in a cold chamber, with free admission of fresh air, and under warm covers, according to the temperature. I clothe myself warmly, wear flannel from neck to feet, and that all the year, changing the outward clothing as often as the weather changes. I bathe as required for cleanliness, but do not tarry in the warm bath, which is weakening.

I avoid excitement of mind as much as practicable, though earnest in business and taking a lively interest in all material improvements and scientific progress, in all that concerns legislation, judicial decisions, and the welfare of my country and the world. I read many newspapers and periodicals. I yet examine titles, give legal opinions, and in public institutions, act as a Park Commissioner, and gather acorns, tree seeds and trees for its nurseries. I also keep a general survey over my real estate.

A tranquil mind I find a requisite to health and longevity, and that the mind may be stayed in a firm tranquillity, I have found a firm faith in an overruling Providence essential. My religious belief, inductively formed, has all the conviction of my understanding, as strong as that in all established scientific truths. All truths have come from the *Creator*, and all are His. God's attributes of might, justice and love we must logically believe, and without these and His absolute goodness, we must infer *Him* and His creation to be failures. It is in believing *Him* to have these attributes; in believing that *He* appeared in *Christ* to save immortal souls, and for that visits them, we can endure, and only so endure, the sufferings incident to life with firmness and equanimity;

often emerging from afflictions with safety where others fail ; and thus fortified, we may humbly hope and expect to reach the end in a faith that will be sustaining, and to pass into happiness, not less, but the greater for that well doing which has made this life happy. Possibly, however, the mind may be clouded by disease, or sunk in apathy at the transition, and express no manifestation of joyful prospect ; yet all will be well ; and if then shall come repentance for misdeeds, with contrition, yet will also come pardon.

This consummation, I now state with confidence, and not inconsiderately, as having the most important relevancy to your inquiries. True, I have not reached the last experience, which is death ; but I have witnessed many of my most beloved pass away, bearing testimony to survivors of what they felt and saw as they entered the dawn of another world, whose light is from *God*.

Some hours of every week, for twenty years, have, with pen in hand, been devoted to the study of the being of *God*, His attributes, and the significance of His works, of the nature and import of our being and destiny, until the product has become voluminous. Hence, I speak with the confidence of the absolute conviction that has sustained me through nearly all of life, that man has the help of a care and strength greater than his own, and that, unless his mind be eclipsed by disease, he will be so sustained in the transition to another life. With such faith and "a love that casteth out fear," trials melt away before us ; we live through them, and see them as clouds that have passed, dispensing blessings, and in a hopeful confidence in

God's care and love, we live longer, better and happier, and even in death know a triumphant joy.

Truly,

(Signed)

ELI K. PRICE.

Here we have presented the sentiments and practices of an aged man who has passed through a singularly useful and thoughtful life. This man has endeavored, as we can see, to learn how he ought to live, and has tried to conform to this knowledge. I can assure you that I see him on the street every day, and that he seems and looks to me as though he might live for many years.

As an evidence of the power of inherent vitality and of English curtness, I might quote the following letter:—

TOWER GROVE PARK, ST. LOUIS, Dec. 3d, 1880.

DR. EDWARDS:—

Dear Sir:—Without going into the particulars you require in regard to longevity, and which, when faithfully related, would demonstrate nothing, and for which I have neither the time or the inclination, may be summarily stated, in saying that my 80 years have been spent in a life of activity and *temperance*, but not abstemiousness; born in England, and 60 years a resident of St. Louis. Yours very respectfully,

(Signed)

HENRY SHAW.

You will notice here two points which our conservative, aged friend mentions, namely, *activity* and *temperance*. I have already dilated on them. By temperance, such a man means not only moderation in drinking, but moderation in everything. By activity, he means a fair and reasonable amount of exercise of all his functions, both mental and physical.

THURLOW WEED.

An interesting letter was received from that old veteran, Thurlow Weed, which reads as follows:—

NEW YORK, March 26th, 1880.

Dear Sir:—My reply to yours of yesterday will prove a disappointment. There is, I fear, very little in my long experience to aid the work you have in hand. For more than sixty years I was too busy to give time or thought to the vital questions you are considering. When, twelve years ago, my health became seriously impaired, my attention was called to the causes, and to such changes as promised alleviation. The first step was to give up *cigar* smoking, an inveterate habit of more than fifty years' standing. I then endeavored to conform my diet, exercise, etc., etc., to the laws regulating health. While I have profited in health by the care and thought rendered necessary by a long disregard of such considerations, I attribute length of days and a large measure of health much more to the goodness and mercy of God, than to any personal influences. I may add that I think that longevity is largely dependent upon inheritance. Some constitutions will endure, however recklessly abused, while in other cases every prudential care and the strictest observance of all laws fail to impart health or long life. A *Herald* reporter conversed with me on this subject two or three days ago. I enclose a printed copy.

Truly yours,

(Signed)

THURLOW WEED.

Since this interview is very interesting, and since it is well for all to have some knowledge of the mode of life pursued by our very aged citizens, particularly

by those who, having themselves passed the hey-day of maturity and activity, are descending the hill of life, rendering it necessary to put on brakes in order that this descent may not be unnecessarily rapid, I will quote from it very extensively. The paper is the New York *Herald*, and the date is Thursday, March 25, 1880. It says, "Mr. Thurlow Weed returned to his home, in this city, yesterday morning, from Albany, where he had inducted the *Evening Journal* into its fifty-first year. He speaks with animation of his flying visit to the scene of his earlier career of usefulness, and is heartier and more buoyant for the brief vacation from his literary labors at home. 'The occasion and the familiar room and chair,' the venerable journalist, diplomatist, and philomath said, in describing his feelings while he sat, on Monday last, in the editorial chair of the Albany *Evening Journal*, and was dictator there for the day, 'brought a rush of memories that were full of interest; memories of the time (1834) when the Whig party was organized, and the *Journal* became that party's recognized organ; memories of the *Journal's* opponents, whom it styled the 'Albany Regency,' among whom were Martin Van Buren, William L. Marcy, Benjamin F. Butler, Thomas W. Olcott, John A. Dix, Azariah C. Flagg, and Silas Wright, with Edwin Crosswell, who was then State Printer, as the editor of their organ; memories that were variegated by the constant flow in upon me, while I sat again in the old editorial chair, of old and valued friends, whom I had not seen for many years; memories saddened somewhat by the thinning out of those friends by the hand of death; memories of those of the *Journal's* friends

whose work is done, among them William H. Seward, Washington Hunt, John A. King, John A. Dix, Henry J. Raymond, Millard Fillmore, Horace Greeley, Gulian C. Verplanck, Ogden Hoffman, John A. Griswold and Moses H. Grinnell; memories to which even a sadder tinge was added by the death, while I sat once more in the editorial chair, of Mr. Van Buren's friend, Thomas W. Olcott, who, as this morning's *Herald* truly says, might have been Secretary of the Treasury under Lincoln.

"Fifty years ago we got news from New York by steamboat, in twelve hours, but while I sat in the editor's chair in the *Journal's* office, on Monday, the news was flashed to us from all parts of the world, and from the Eastern hemisphere, ahead of time.'

"Mr. Weed went to his stateroom in a North River steamboat on Monday night, at his usual hour for retiring, but not to sleep as though he had been at home. It was not the jarring machinery that kept him awake, but the memories of the villages and cities he was passing. 'Although I could not see them,' he said, 'I knew them by the time. I remembered them as they were when I was employed as a cabin boy in a North River sloop, in 1806 or 1807, and when we required from three days to a week to make the trip. Then the city of Hudson was engaged in whaling; I have seen three or four whale ships at Hudson's wharves simultaneously. Think of whalers sailing up to Hudson now. Then, there is the flourishing village of Athens, in those times the mere hamlet of Lunenburg; and now we passed East and West Camp, the Emboch and other towns with primitive names, that are now Bristol,

Tivoli, Barrytown, etc. I got only three hours' sleep, my brain was so busy with the scenes that the boat was passing—a boat that frightened nobody now. You have not read that everybody north of Spuyten Duyvil Creek was frightened when Robert Fulton's '*Clermont*' ploughed her way up the Hudson, vomiting smoke and fire, and with uncovered paddle-wheels, moved by no visible agency. I recalled it while I lay in my state-room on Monday night. Poor Fulton! it is a disgrace to the country that his remains should lie in a private tomb down town, with not so much as the word "Fulton" to mark his last resting place. I awoke at my usual hour, as much refreshed as though I had slept at home.'"

These reminiscences of this veteran have been transcribed for a purpose. It must be delightful, and must surely afford him incalculable pleasure in his old age, to look back over the long journey he has traveled so well, and many a pleasant hour can he pass in reflection. Such a blessing can fall to the lot of every man or woman who will live as they ought, and if there were no others, this one inducement should be enough to make all desire to attain old age, and so live as to make its attainment possible.

"You live very methodically, I have been told," said the reporter; "are you conscious of any symptoms of indigestion and its inevitable derangement of the system, after a journey in which you must change your diet." 'I ate nothing in the steamboat, and my daughter in Albany, whose house is my home when I go up the river, twice a year, knows my regimen so accurately, that when I sit down at her table everything

is as I have it in New York. I fancy that my regularity has prolonged my life.'

"Do you use intoxicating liquors?"

"In my early life, as an editor, I drank sparingly of champagne at dinners, now and then, but only occasionally and socially; and when, in 1845, I went to the West Indies, for my daughter's health, I acquired a taste for the fine old Santa Cruz rum that the planters brewed for home use. It is not sold over the bars. I have some of it on hand, and every night, before going to bed, I drink a little of it, mixed with Vichy. I think it does me good. I drink no intoxicating liquor at any other time, although I have a cellar full of wine. I used to go out a great deal, but since I had a sunstroke, about twelve years ago, I have declined all dinners and evening receptions. I smoked tobacco—the best mild Havana cigars—for more than fifty years, but I used the weed in no other form. Thirteen years ago my physician warned me that tobacco was affecting my nervous system, and *thereupon I burned my cigar boxes*. I used no substitute, and a fortnight later I forgot my smoking. FROM THAT TIME I WROTE WITH GREATER FACILITY.'

MR. WEED'S ROUTINE.

"The well-preserved old gentleman readily complied when requested to recite the routine of a man who, having lived to be eighty-two, *knows how to live*. 'Before my morning meal, at eight o'clock,' he said, 'I eat either one-half of a large apple or an orange from my daughter's orange grove in Florida, rejecting the pulp. At breakfast I have oatmeal, the yolk of hard-boiled eggs, a piece of toast, the best kind of English break-

fast tea, and certain kinds of fish in season, such as Spanish mackerel, which I esteem a delicacy, and porgies. Sometimes I have cold roast beef, or a saddle of mutton, and at least once a week—for breakfast, on Sunday usually—corned beef hash. A light luncheon is served at one o'clock, and sometimes I eat a slice of cold corned beef, or of cold mutton, but always bread, about the equivalent of corn bread—we call them buttered gems—and sometimes at this luncheon we have sardines. Cold water is the only liquid on the table at that hour. At six o'clock I have always fish, of whatever kind may be in season. For fifteen years I have eaten no dessert of any kind except a little fruit.'

"Mr. Weed is out of bed at seven every morning, and after breakfast he enters upon his literary labors. In the afternoon he sits in his well-stocked library and chats with friends until tea-time, and then he chats with friends until ten o'clock. Then he goes to his room, and either his daughter or another member of the family reads Dickens, Thackeray or Scott or some other author, for an hour and a quarter; then prayer is read from the Rev. Ashton Oxenden's '*Prayers for Private Use*,' and at a quarter past eleven the veteran drinks a glass of Santa Cruz rum and Vichy and goes to bed. His sleep is almost uniformly refreshing.

"In relation to his interest in the temperance cause, Mr. Weed said: 'I am with those who seek to mitigate the evils of intemperance, for while human nature is what it is, all prohibitory laws must fail. A like vigor of effort in another direction would yield good results. If I were a younger man, I would labor to make ours

a great grape-growing country, so that wine might be as cheap as cider, and I would impose an almost prohibitive tariff upon imported and distilled liquors. I would strive to make our country what France is—a sober country.’ ”

These views and these facts must possess interest. Remember that they come from a man who is now eighty-four years old and who is known all over the world. What he says, he says from experience ; what he does, he does because he has found it to be the right thing to do. It is a pity that such a man does not enter more fully and more minutely into the details of the life which he has outlined, but by carefully considering what he has said we can learn many valuable lessons.

My aged friends will now hear from Mr. W. W. Corcoran, the world-famed philanthropist, of Washington, D. C.—

MR. CORCORAN'S LETTER.

WASHINGTON, Oct. 7th, 1880.

DR. J. F. EDWARDS:—

Dear Sir :—As the confidential agent of Mr. Corcoran, I have received your communication of the 3d, containing questions in regard to his health, manner of life, etc., from boyhood to the present period.

Allow me to say that it is very difficult to return categorical answers to these specific interrogatories ; but if it will in any degree serve to promote the object contemplated by you, I cheerfully submit the following statement:—

Mr. C. was born in Georgetown, D. C., and inherited no “predisposition to any disease.” His occupa-

tion through life has been sometimes active and sometimes sedentary. He has never used tobacco, but has occasionally indulged in the moderate use of wine. His constitution was naturally robust, and he has never been very particular in the adoption of prophylactic (disease preventing) measures. In 1871 he had a severe attack of erysipelas, and he is now 82 years of age and in good health.

Very respectfully yours,

(Signed)

A. HYDE.

We will now hear from an old veteran who has been already mentioned, and who certainly enjoyed the pleasures of life as well as any man who ever lived. I mean General Robert Patterson, of Philadelphia.

GENERAL PATTERSON'S LETTER.

1300 LOCUST ST., PHILADA., Sept. 11th, 1880.

DR. J. F. EDWARDS:—

Dear Sir:—Your note of 9th is received, and in compliance with your request I enclose answers to your seventeen inquiries, and hope they may be of service, as your object is a good one.

I remain, with great respect, truly yours,

(Signed)

R. PATTERSON.

ANSWERS.

1. The age of my father at the time of his death was eighty-five.
2. The cause of death was advanced age.
3. The age of my mother at the time of her death was ninety.
4. Old age.
5. I did not inherit a predisposition to disease ; on

the contrary, I inherited a vigorous constitution, with excellent health.

6. I was raised in the country, a farmer's son; rose at daylight, if not sooner; took much physical exercise constantly in the open air.

7. My temperament was very sanguine; of good disposition if not annoyed.

8. Early education partook of the physical more than the mental, but I had a good Scotch-Irish mother who kept my mental faculties under sufficient culture.

9. I have rarely used alcohol, but am accustomed to the use of good wines at my dinner. Have never used tobacco, and consider its use as exceedingly pernicious to health.

10. Of late years my business occupation has been sedentary, but my habits have always been very active, always having been fond of and following the sports of the chase.

11. Have suffered very little from sickness; had once a severe attack of pneumonia.

12. I have always used a moderate cup of coffee at breakfast and of tea at supper.

13. I am not particularly careful of my diet, but avoid that which I learn from experience to be hurtful.

14. I usually retire to rest about 10 P. M. and rise about 5 A. M.; of late years I do not rise so early in winter.

15. I have not always been careful of my health, and have "roughed it" in all weather.

16. My constitution is naturally robust.

17. I was eighty-eight years of age January 12th, 1880.

LETTER FROM CORNELIUS RATLIFF.

RICHMOND, IND., Eleventh month, 5th, 1880.

DR. J. F. EDWARDS:—

Dear Friend.:—Thy letter of the 2d inst. is at hand, and as thee is desirous of obtaining some information for thy proposed work, “How We Ought to Live,” so far as I am concerned thee is welcome to all I am able to contribute in that direction. I think it a praiseworthy undertaking, and hope thy efforts may be crowned with success.

1. Seventy-two years ; natural decline of age ; a little dyspeptic.
2. Seventy-one years ; natural decline of age.
3. I know of no such predisposition.
4. Raised on a farm, helped to clear my father's land, and have ever since lived on the same farm and followed the business of farming.
5. Somewhat bilious.
6. Smoked a little in middle life ; never used alcoholic drinks.
7. Always active.
8. Have never been so but what I could get up and dress myself every morning, in seventy years.
9. For many years have used coffee once a day.
10. My diet has been, and still is, plain, wholesome food.
11. “Early to bed and early to rise.”
12. I have.
13. Moderately robust.
14. Eighty-two next Christmas.
15. I do.

16. American—born in North Carolina.

Truly thy friend,

(Signed)

CORNELIUS RATLIFF, SEN.

A VERY INTERESTING LETTER FROM A PHYSICIAN.

PORTSMOUTH, OHIO, Nov. 29th, 1881.

DR. EDWARDS:—

My Dear Doctor:—I should have answered your letter immediately upon its reception, but I was confined to my bed by an attack of hepatic calculi (gall stone), and as soon as relieved, your letter was the first to receive attention. I consider your subject one of vast importance, for I know of no reason why a man's life may not be extended to 100 years as well as to 70 or 80.

To your first and second questions, I reply: My father died at the age of sixty years (a hale, active man), of typhoid pneumonia; my mother at fifty-two, of yellow fever, both at Marietta, Ohio.

2. I know of no inherited disease, as both parents were, at the time of their attacks, hale, hearty and active. From my maternal grandfather I inherited a gouty diathesis (a tendency to gout), but coming to Ohio in my early youth, in pioneer times, when the predisposing and exciting causes of that disease were few and far between, the disease was never developed. I was born in New London, Connecticut, on June 8th, 1794, and raised at Marietta, Ohio. I was, from necessity, compelled to a sedentary life in my early days. My mind was not active to acquire knowledge, and consequently I was forced to spend many hours at my books while my companions were at play; this lack of exercise induced dyspepsia, from which I suffered

from my earliest recollection till I was engaged in the practice of medicine in a sparsely settled territory, comprising thirty miles in circuit every way. In a new country of this extent many hardships had to be encountered; swimming creeks, facing all kinds of weather, and traveling all varieties of roads.

My daily rides were from ten to twenty-five miles, AND I SOON BID ADIEU TO EVERYTHING IN THE SHAPE OF INDIGESTION, AND BECAME VERY ROBUST.

During the prevalence of an epidemic fever I frequently rode forty miles in the forenoon, changed horses and rode forty miles in the afternoon. Such was the stamina this exercise produced, that I escaped the epidemic entirely, while all others were its victims.

With this health I feared nothing and avoided nothing. In early life, while in Connecticut, I was of the sanguine temperament, but the malarious valley of the Ohio soon changed it to the bilious, with all that term implies.

I have been through all the phases of the tobacco question. At the age of thirteen years I commenced chewing and smoking, and continued both twenty-nine years, then dropped chewing and continued smoking twenty-three years, making in all fifty-two years, and in that time I used snuff eleven years. *At the age of sixty-four years I quit all tobacco, and in that year put on twenty-five pounds in weight,* and have been steadily increasing until now. I weigh two hundred pounds. (This is worthy of note, since, ordinarily, old people gradually decline in weight.)

In the use of alcohol, I have not been quite as extravagant as in the use of tobacco, though my experi-

ence is not very limited. I am satisfied that alcohol is antagonistic to the poison of tobacco, and he who uses the latter to excess must naturally fall into the use of the former or suffer from the toxic (poisonous) effects of the latter.

I was never intoxicated, but was for more than twenty years an habitual drinker ; for the last twenty-four or twenty-five years have touched not, tasted not, handled not, or, ever since I quit the use of tobacco.

Of course, my life, until the last twenty-four years, was a very laborious and active one, but for the last twenty-four years I have been a close student, and my habits sedentary ; which accounts for the hepatic (liver) derangement under which I have suffered for the last ten or fifteen years. All my early life, till the age of twenty-five, I was a dyspeptic. In that time I passed through five years of *intermittent* seasoning of the country ; have had two attacks of typho-malarial fever, the last in 1824, when I was thirty years old. Since that time I have had excellent health, except in the last few years of *sedentary life*, in which I have had frequent passages of gall stones through the common duct. These, for the last few years, have been attended with less pain and nausea than formerly. I should mention here, that in the last ten years I have been troubled with epithelioma (a form of cancer) on the cheek and ear ; the former has been healed about four years, the latter is now under treatment and is improving.

My maternal grandfather, when a young man, had an epithelial cancer removed from his lip, with no return of that disease except a horny growth between

his thumb and forefinger, giving no trouble, but at the age of eighty years he concluded to have it removed; a *quack* was employed and the old gentleman died.

Until I was sixty-eight years of age I used very sparingly tea and coffee, but under protest. Since then, I have refrained from both, and use milk; if I cannot get this, I use water, and find great benefit from the change in many ways.

Since I ceased to be a dyspeptic, I have not had much regard to my diet; eating those things which I relished best, and always stopping with a good appetite and relish for my food. A few minutes after eating, I have frequently been at a loss to call to mind what has constituted my meal.

I have all my life been an early riser; retiring at 9 o'clock, P. M., and during my college life rising at 2 A. M. During my professional life I retired at the same hour and rose at 4 A. M.; which is my present habit. I find seven hours, with a short nap after dinner, quite sufficient for all purposes of rest.

I have never saved myself in any way or at any time. In the last few years I have been more careful of sudden changes; fearing bronchitis, which has been the bane of many of my ancestors. I wear no under-clothing except a low temperature seems to call for it, and as soon as the thermometer rises throw it off.

I have a fine physical organization, from a race of long-lived ancestors, *but it was late in being developed, for lack of proper exercise.* In addition to a good physical organization I had, fortunately, a conservative engineer to run it. If a difficulty could be overcome, it was done; if not, thrown over the left shoulder and

passed by. *I've never cried for spilled milk.* There never was any fret or worry in my composition. I completed my 87th year on the 8th day of June last.

I am considered unusually vigorous and healthy for a man of my age ; strangers say I would pass for a man twenty years younger than I am. My ancestors were English ; I am a full-blooded *Puritan Yankee*, and I am proud of it.

I have questioned a number of aged persons in regard to their habits and their ways ; in but one thing do I find them in full accord ; that is, they were "Early to bed and early to rise."

Respectfully yours,

(Signed)

G. S. B. HEMPSTEAD.

From this communication of the experience of a very old man we learn some lessons. We find that after many years he found it advisable to abandon the use of tobacco and alcohol. You may say that it took him a good many years to find this out, and that if these two articles are poisons, they must be very slow in their action, since he has used them for so many years and yet is such an old man. But he did find it out from his own experience, and then abandoned both. Since you know that the old man is formed just the same and is subject to the same fundamental laws of health as the young man, the same things that will be injurious to the one must be detrimental to the other ; of course, you can understand that the young and vigorous man can more successfully combat and vanquish evil influences that will prove more dangerous to the aged and weak man ; but at the same time, that which will affect the one will likewise influence the

other, though in different degrees. Therefore, if certain things are injurious to an old man, the same will also injure a young man, but their evil influences will be less felt at the time, because, as you can understand, the physical power, the vital force, or vigor of the young man is so great that he can throw them off.

To make, again, a commonplace illustration: Suppose a man with one hundred thousand dollars invests ten thousand in some venture that will prove disastrous. Suppose he buys a property and pays ten thousand dollars for it, when, to the judgment of older and more experienced men, it is going to depreciate in value; now, in two or three years he may have to sell for eight thousand. If he learns from experience, and does not make the same mistake a second time, this first loss will not prove very disastrous, and he will be able to hold his principal, with only a small reduction of its original proportions. But suppose he keeps on buying for ten what he will be compelled to sell for eight thousand; his capital will soon become exhausted, and he will early die pecuniarily. On the other hand, suppose a man with one hundred thousand dollars has been for years gradually spending this money, until he only has a few thousands left; let him now make *one* of these unfortunate investments and he is ruined. The want of judgment has acted just the same on the small as on the large capital, but the former has not been able to stand the same demand that the latter can; the exaction is too great and the financially weak man collapses. So it is with vital force. If a young man has, say, one hundred parts of vital force, it will last him a certain time. Suppose it requires one por-

tion of this force to maintain life for one year; then, under ordinary circumstances, he can live for one hundred years. But if he uses up two or three parts of this force in one year, by living recklessly, he will not feel or appreciate the unnatural demand at the time, because he has a large stock behind, but he is none the less surely consuming or wasting the power that he will want later on. If, then, he uses seventy parts in twenty-five years, common sense will teach that he has only thirty parts left, and if, by great care, he now uses only one part in a year, he can only live thirty years. If, again, with only thirty parts remaining, he continues reckless, it is evident that he can only live ten years, and so on.

I do not mean to enunciate the figures I have given above as absolute rules. I merely use them to make familiar to your minds the fact that an old man must be more careful than a young man, because he has less vital power; while at the same time I desire you to realize that injudicious or dangerous living really has just as much evil influence on the young man, but that he fails to realize it because he possesses such a large capital. All this talk really means that what old men have found by experience to be injurious to them, young men must be told in plain words will be and is actually equally detrimental to their long life.

If these aged individuals (who have, only after many years of experience, learned what they ought and what they ought not to do), had known, in youth, how to live, they might and most probably would have attained even a greater degree of longevity than has been vouchsafed to them.

So that, realizing myself, and hoping that I have made clear to you the fact, that what old persons have found to be right is not only applicable to octogenarians, but also to the young, I will go on and furnish some more letters:—

OFFICE OF R. C. & W. B. GREGORY,
Attorneys-at-Law, National State Bank Building,
LA FAYETTE, IND., Nov. 21st, 1881.

Dear Sir:—In answer to your circular, I say that my father was sixty-three years of age at the time of his death. He was a robust man, but contracted the black vomit (yellow fever) in Central America, and died there, in 1843. My mother died with malarial fever when she was sixty-eight years old. I inherited no disease from my parents; they were both robust, and naturally enjoyed good health. I am of sanguine, bilious temperament. I never used tobacco in any form. In early life, until about twenty-two years of age, I used alcoholic drinks, such as whisky, brandy, wine and beer. I then became a total abstainer, and continued to be such until I was fifty-five years of age, at which time I commenced the moderate use of whisky, wine and beer. I never was a drunkard, or indulged in spree, but drank regularly every day. In early life I lived and worked on a farm, from the time I was fifteen years old until I was twenty-six. I was a clerk in a store and a merchant. I have since been a law student, a lawyer and a judge. I have not taken much exercise, my profession requiring all my time. During the six years I was judge I took very little exercise, but devoted my entire time to my duties.

For some five or six years, in early life, I was sick

most of the time with fever and ague; since then, with the exception of a few times, my health has been good. For the last few years I have had rheumatism. I have used coffee all my life, but not tea. I am not careful of my diet; *I eat too fast and too much, and pay the penalty of* SOUR STOMACH.

In late years I sleep ten hours, keeping regular habits; in early and middle life I was regular, but did not sleep over eight hours, often less.

I have not been careful of my health; I am naturally of robust constitution, inherited from a vigorous ancestry—Scotch-Irish.

I am now seventy-one years of age, and am in the enjoyment of vigorous health. I am able to do as much work in my profession as I ever could, in some departments more.

I am an American, born in Kentucky and raised in Indiana. I have been a resident of Indiana ever since 1813, being only two years old when my father emigrated to the *Indiana Territory*.

I attribute my long life to a robust constitution inherited from a long line of ancestors; on my father's side *Scotch-Irish*, and on my mother's (the Lees), English. *I do not think my mode of life has either lengthened or shortened it.* Yours, etc.,

(Signed)

ROBERT C. GREGORY.

While the contents of this letter, and more particularly the concluding sentence, which I have put in *italics*, would seem to convey the impression that *heredity* had more to do with longevity than *care*; yet we must not judge too hastily, or too superficially. We must peer beneath the seeming surface, and look more

deeply into the question. While it would seem that Mr. Gregory, as well as many others whom I have, and still more whom I will quote, have taken no care of themselves, and have seemed to live as they pleased, and even carelessly or recklessly, yet we notice, from the tone of their communications, that their lives have been more or less *methodical*. While they seem not to have been particularly careful in their mode of life, yet we can perceive that, with the inheritance of vigor, they have also received a stock of *natural prudence*, that has directed their lives into such a channel as all the teachings of this book indicate. It has been no effort for them to attain old age, because they have inherited both vigor and prudence. For such men, I am not writing.

There are two classes of men to whom my book is addressed.—

1st. Those who inherit vigor, without prudence, to whom I desire to supply the wanting factor of longevity.

2d. Those who inherit prudence, with only a moderate amount of vigor. To them I address myself in a particular manner. Their prudence I desire to so direct that it may make the most of their vigor.

While there may seem a certain sameness about these numerous letters, yet from each and every one we can learn something. Remember, they are all from old men, and remember also that what is good for the aged is likewise good for the youthful.

The following is from a resident of St. Joseph, Mo., who does not wish his name made public. His father died at the age of 109 and his mother at 107. He was

raised in the city and was accustomed to much activity. His temperament is sanguine. He uses both tobacco and alcohol very liberally. He retires at 8.30 P. M. and gets up at 3 A. M. He is 82 years old. From this gentleman's letter, it is evident that he has inherited such an enormous amount of vigor that it would be almost impossible to kill him; therefore, since he is such a wonderful exception, we cannot learn much from his experience, but must regard him rather in the light of a curiosity.

BLOOMINGTON, Ill., Nov., 1880.

1. Father was 65 years old when he died.
2. Mother died at 74, of consumption.
3. I inherited scrofula, which appeared when I was about 16 years old.
4. I was raised in the country, except about two years.
5. My temperament is sanguine.
6. I never used tobacco, and am an almost total abstainer from alcohol.
7. Some of my life has been passed behind the counter, and some of my time farming; I take considerable exercise.
8. I have not had much sickness.
9. I have always used tea and coffee.
10. I have always retired early.
11. I am rather delicate.
12. I shall be eighty-eight years old the 21st of January next.

Very respectfully,

(Signed)

JOHN BUDD.

These few letters have been inserted for the purpose of giving you an idea of how old men live, and have lived, that they may become old.

In the appendix will be found many more, so that those who may desire to read them all can do so by reference to the appendix, while those who would consider such reading tiresome, can let it alone, without losing the thread of the book.

Therefore, in conclusion, old persons must remember that they are weaker and have less vigor than their children. They must, as I have already said, be very particular not to exhaust their already weakening vigor, else they will use it up unnecessarily soon.

There are no *special* rules of life to be laid down for the aged; though some writers claim that there are, and will thus harass and worry the mind of an old man or woman, by setting before them certain regulations which, maybe, will be difficult of fulfillment.

In a word, in dismissing the subject, and in making it as easy and as comfortable as possible for you, I will say that the old man can and ought to live just as he did when young, *only he must be careful to do less of everything*, EXCEPT NOTHING. It requires no expenditure of force *to do nothing*, and therefore such occupation, unless carried to excess, will be the very best pastime for old persons. But to lay fun aside and be serious, an old person needs only to be careful that he does less work than he was accustomed to when young, and all will be well. His vigor will be equal to all demands made upon it, and he will continue to enjoy life as he has done, and will last as long as is possible for any one who has inherited an equal amount of vital force to hold out.

CHAPTER XVII.

HOW A CONSUMPTIVE OUGHT TO LIVE.

By far the most fatal disease known to human nature is that terrible malady called consumption. Let us for a short time consider, that you may rightly understand what it means ; but before doing so let me tell you four facts :—

1st. Consumption kills annually, in our country, more than ten times as many persons as fall victims to any other disease.

2d. The general belief that consumption is confined to those that inherit it is erroneous ; it can and does attack the most healthy, and those in whose family it has never been known to exist before.

3d. Consumption when taken in time is curable, in the very large majority of cases.

4th. Medicine (or drugs) has very little influence on the progress of consumption ; if checked, it must be by hygiene, or by proper life.

Consumption means a destruction of the tissue of the lungs. There are two lungs in the body of every human being, and you now understand what important duties these organs have to perform ; so that you will be prepared to understand how impossible healthy life will be without the full performance of their duty.

We know that all parts of the body, as all parts of a machine, are necessary, that the body or machine may fulfill its duty, but in an especial manner are the lungs requisite to healthy and prolonged life.

Through their agency the blood is freed from many of its impurities. In their interstices an interchange takes place between the vital elements of pure atmosphere and the poisonous ingredients contained in the blood.

When the pure blood is pumped out from the heart and into the main blood vessel, it is carried throughout the whole body, into every portion thereof. This liquid, thus circulating, has two duties to perform. It not only carries nourishment to all the muscles and organs of the body, but it also picks up in its course the results of the change in tissue necessary for life. Like the street sweepers, who go about collecting into piles or heaps the refuse of the city, so the various parts collect together their own dead tissue, that which has served its purpose in the phenomena of life, and is no longer of any use.

The carts following after the sweepers are filled with this refuse, and they carry it away, to be finally disposed of and purified by the processes of nature.

So when the blood comes around to any collection of dead human tissue, it picks it up, absorbs it, as it were, into itself, and carries it on to the various organs whose duty it is to remove it from the body.

Some of this load is eliminated by the skin, some by the kidneys, some by the bowels, and so on; the various scavengers or eliminating organs have each their own particular, special duty to perform in removing from the body those elements whose continued presence would prove detrimental to health and long life.

In an especial manner are the lungs scavengers.

After the blood has circulated throughout the whole body, it is returned again to the heart. In its course, it has parted with much of the dead tissue it has accumulated, but when it reaches the heart it still contains very much dead matter. Entering one cavity, it is forced through one of the openings I have described into another, and from there is pumped into the lungs, where much of its load of impurity is removed, and it is rendered once more fit to nourish the body, through the renovating influence of pure air.

I must here again say that good action on the part of all organs is necessary for long life, but some are, of course, more important than others.

The position occupied by the lungs in the maintenance of life cannot be placed too prominently, since it is through their agency that oxygen enters the body, and from the chapter on ventilation, you can understand how important this element is for lengthy life.

We must remember that the purposes of ventilation are not accomplished when we have secured the introduction of fresh air into our rooms and houses; our bodies must be ventilated as well, and to accomplish this, pure air containing plenty of oxygen must enter the body. In order that it may so enter, it is compelled to pass through the lungs; it cannot pass through diseased lungs, any more or better than a man can walk along a crowded street.

When the lung is diseased, it is choked up; it is full of its own dead tissue, hence it offers a mechanical obstruction to the passage of oxygen through its walls, and thus prevents its introduction into the body. Besides this mechanical obstruction, consumption of the

lungs in many other ways will interfere with the entrance of oxygen ; but these we need not here discuss, because they would be unintelligible to non-medical minds and are unnecessary, since you can accept as a fact the statement that diseased lungs cannot allow oxygen to enter the blood in sufficient quantity.

Decomposition of any organic material is accomplished by the same process and is subject to the same laws. It matters not whether the material be animal or vegetable, it is influenced by the same conditions. When organic matter decomposes, it does so by a change in the relative composition of its various elements. You know that matter is indestructible, therefore, the tissue of the lung is not really *destroyed* in consumption, but its composition is so altered that it is unable to properly perform its duty.

There are several varieties of consumption of the lungs described in medical text-books, but for the purposes of this work, we may consider them all as one and the same, since they all really produce their disastrous results in the same way, that is by so disintegrating and altering the lungs that they become unable to perform their part in the drama of life. Inflammation of the lungs oftentimes results in consumption, and since inflammation is usually the result of "catching cold," those whose lungs are weak, or who may have inherited a *tendency* to weakness or disease of these organs, are very liable to have the smouldering flame started into activity by exposure.

Since you now understand what is meant by consumption, a few words about how to live when so afflicted, or when you may have reason to fear a predis-

position, will, if faithfully observed and conscientiously lived up to, result in saving very many lives.

It is a fact, beyond dispute, that even where the hereditary tendency to this disease is most marked, as, for instance, when both parents have died from it, its period of development may be warded off for many years, or even, in some cases, the tendency may be entirely eradicated from the system. It would seem that with any inherited disease, so called, the disease itself, as an abnormal condition of any organ or part, is not in reality born with the individual, but rather he receives from his parents a peculiar condition, which we will call a weakness of the particular organ or part, on account of which such organ is rendered abnormally sensitive to deleterious influences, so that any disease-producing causes acting on it will be capable of deranging it, even though they may be so slight that they would have no effect whatever on another individual who had not inherited this weakened condition.

This idea of heredity seems to be the true one, because it is an exceedingly rare thing to detect disease (with one single exception) in the new-born child. Consumptive parents will usually beget healthy children, and it is not until, as they grow older, and are subjected to some cause, that the disease becomes developed.

Remembering this, parents will be prepared to understand how important it will be to guard the lungs of children who may belong to a family in the disease history of which consumption is at all prominent. An ounce of prevention is much better in this disease than tons of cure, because, when once thoroughly established

the cures are rare, while the cases in which proper hygienic precautions can and will prevent the development of the disease are exceedingly numerous.

You must remember that a very prolific cause of consumption is the breathing of impure air. These impurities are irritating to the tissue of the lung, and this irritation acting on an hereditarily weak lung may set up an inflammation that will result in consumption. Therefore, one of the first considerations in the lives of those suffering from or predisposed to this disease, must be to secure plenty of pure, fresh air. Consumption is, par excellence, a disease of cities and civilization; it is almost unknown among the wandering savage tribes whose lives, from birth to death, are passed in the open air. From this, consumptives can learn a valuable lesson. It would be almost suicidal for such a person to remain cooped up in a musty house in a large city, where the atmosphere is necessarily constantly full of all sorts of impurities; such confinement ought not to be tolerated for an instant.

The true way for such persons to live would be in tents; in fact, the "Tent Cure" for consumption has now come to be recognized among physicians as the most potent means of counteracting and staying the ravages of this dreadful disease, and we must place it in the first rank of remedial hygienic measures. By tent-life is meant to spend the day absolutely in the open air, and at night to sleep in a tent, in the country, so that you are constantly inhaling pure air; and I would add that it would be better for you never to enter a city or a house while undergoing this treatment.

If you will ask how long such a life ought to be indulged in, I can only answer that it depends upon yourself. If you were to so live all the time, it would be better, of course; some will be much benefited in a few weeks, while other cases will require several months. If a man has consumption, and desires to live as long as possible, irrespective of *how* he lives, then ought his life to be passed in such a way, visiting crowded cities only when pressing necessity demanded it, and making his visits therein as short as possible.

Such a life, followed for several months, will, in some cases, effect a radical cure of the disease, so that the man or woman can, if they wish, return to and reside in the city, and never suffer any further inconvenience.

Again, there is another class, to whom several months of such life will, without working an absolute cure, yet so improve the trouble in the lungs and benefit and strengthen the general system, that the patient may return to the city, to his usual occupation, for some time, when, the disease gaining headway again, he commences to fail, to *run down*, as it were, and another sojourn in his tent is indicated.

He must be careful to heed the first indications of advancing disease, and hurry off to the country, else, possibly, such progress may be made that it will be impossible for him to again recuperate. By thus carefully guarding his lungs, and relieving them, upon the first approach of danger, may he be enabled to prolong his life for many years and to enjoy much comfort.

But, unfortunately, this tent life is denied to the great masses of mankind, who are compelled to earn their living by daily labor, and can be indulged in only

by those few upon whom fortune has smiled. Were we to live the natural lives of our early ancestors, we could all enjoy this blessing, and I am quite sure consumption would be an unheard-of disease. But, since we cannot, it behooves me to teach a mode of life capable of being followed by all, which will tend to hold in check the progress of this disease. We can all live in the *country*, if we choose, and consumptives *must* do so, if they desire to prolong their lives.

If any of my readers, living in the city, happen to be so unfortunate as to have the slightest taint of consumption in their families, and if they have children, let me beg of them, for the love they bear these little ones, to move at once into the country. From what I have already said (in a previous chapter), you can understand how easy it will be for you to reside a few miles away from the city, and come daily, or as necessity may require, to town, to attend to business. If you neglect this advice because your little children *look* strong and hearty, and such a life would be inconvenient and distasteful to you, take my word for it, and remember well what I am going to say: Many of you will bitterly lament your neglect when, in a few years' time, you bend weeping over the coffin of one of your dear little ones, who has died of consumption, or some similar wasting disease, and as you gaze on the dead, white face, the advice I have just given will come into your mind like an accusing angel, while you will never cease to regret, until the hour of your own death, your neglect, and that you did not take your children to the country when you had the chance, so that they might have outgrown the tendency to disease, and have lived to become your pride and pleasure.

While you can understand, from what has been already said in this work, that the country is the proper place for *all* to live, yet I desire to impress on you in an especial manner the fact of the immensely great importance of such a residence for all predisposed to or suffering from consumption.

The reason is simple enough, and has already been given: It is merely because these weakened lungs require pure air to a greater extent, and are more injured by impure air than are the strong lungs of a healthy person; and pure air, really good air, is to be best found in the country. There is the whole question in small compass.

In the beginning of this chapter I told you that consumption was characterized by a decomposition of the tissue of the lung. There are two conditions that must be always present in order that decomposition of organic matter can occur, namely, heat and moisture; without them it is impossible. From this fact we learn a point, and a valuable one, in the hygiene of consumption. Now, in winter, the housekeeper will buy a leg of mutton and hang it out of the window for a week, at the end of which time it is cooked and eaten. If she did the same in summer the meat would decompose; it would not be fit to serve its purpose in the human economy; it could not properly nourish the human body. You, of course, see the point I am going to make, that while heat favors, cold arrests decomposition. The decomposition of the lung in consumption is practically the same as the decomposition of the leg of mutton in summer. They both require heat and moisture, else they cannot decompose. If the leg of mutton and the lung were kept in an hermetically

sealed ice chest, it would be impossible for decomposition to take place.

I have seen, in Rome, in the famous church belonging to the Capuchin order of monks, the body of "*Blessed Crispino*," who has been dead for one hundred and thirty-five years. It is almost as perfect to-day (or was, when I saw it) as it was at the hour of death. But why? Because it is hermetically sealed up. Neither *air*, *moisture*, heat or cold can come into contact with this organic mass. Therefore it cannot decompose.

So also have I seen, in the world-famous cathedral of Milan, the remains, or indeed, I must say, the whole body, of that grandly good man, Charles Borromeo, Catholic Bishop of Milan more than three hundred years ago. Also, have I seen, in Bologna, the thoroughly preserved body of "Saint Catharine, of Bologna." I could tell of many other wonderful instances of preservation from decomposition that I have seen in the cities of wonderful Europe, but these few will suffice to illustrate the point I desire to impress upon you. How have these bodies been preserved? Why have they not decomposed and resolved themselves into their original elements? For two reasons:—

1st. Because they have been, at the time of death, prepared, as the Egyptian mummies were; they were saturated, as the subjects in our dissecting rooms are, with certain chemicals that have a tendency to arrest decomposition.

2d. After such preparation they have been encased in *air-tight* apartments, into which it has been impossible for air to enter.

Since air, heat and moisture are essential for decomposition, and since heat and moisture are, without the companionship of air, impotent to cause decomposition, because, though heat and moisture may act to decompose, the results of this decomposition may not be made apparent without the presence of air, since *motion* is necessary to make any *natural* phenomenon apparent to human eyes, and motion cannot take place in an hermetically sealed case; it is necessary that the air shall pass across any decomposing body or mass, in order that it may thoroughly alter its composition.

To illustrate, I will tell you about a very interesting trip I made through the underground church of St. Clements, in Rome, in 1870. The party of which I made one was under the personal supervision of Father Mulooley, an Irish Dominican, head of the Order in Rome. After showing us all the wonders of this subterranean church, which had been erected in the year 300 A. D., he finally brought us before a sarcophagus, and told us that he himself had superintended the opening of this case, or marble covering, and that when opened it contained the body of a bishop in full attire, but that as soon as exposed to the air it all crumbled and fell to dust.

Here, then, we have the fact presented to us of organic matter remaining intact, as it were, undergoing decomposition, it is true, but retaining its original shape, until exposed to the atmosphere.

Since, as you now understand, the principal factor in consumption is the decomposition of the tissue of the lungs, and since this process is subject to and influ-

enced by the same powers that control decomposition of organic matter anywhere else, it will be plain to your minds that the best way to avoid consumption, or to retard its progress, will be to resort to those measures calculated to prevent decomposition.

Since heat and moisture are the two principal factors of decomposition, then does it logically follow that the reverse of these two conditions is what the consumptive desires to attain.

From this has grown the idea that those with weak lungs ought to avoid damp localities, and this idea is correct.

The ideal location for such a person would be the driest to be found, no matter how cold it may be.

Hence have the climates of Colorado and Minnesota become so noted for consumptives. Then we can dismiss the subject of climate with the advice that you will require a *dry, cold* atmosphere.

A consumptive must live liberally. High living, unless it derange the stomach, will be conducive to the general health, and will tend to hold the disease of the lungs in check.

I once knew a very intelligent physician who inherited a tendency to weak lungs. When the tendency became a reality, and he commenced to go into a decline, he made up his mind that he would do all in his power to cultivate *gout*, believing that one disease would counteract the other. So he ate all kinds of good, rich articles, drank wine, and lived generally in such an epicurean style that, had he lived long enough, he would have been able to have cultivated a first-class case of *gout*.

By this mode of life his general physique did improve ; he became stouter, stronger, enjoyed life more, felt better and was better, and though he died young, yet I have no doubt that his mode of life added several years to his earthly existence.

A word of caution will here be necessary. This high living will derange the stomach in some persons ; if it does do so, then will it hasten the progress of the disease, and in such instances it ought not to be persevered in.

The main indications in the life of a consumptive teach them to supply plenty of fresh air to the lungs, and to keep up the general health and strength. These two points are really all that are worth talking or writing about, since they are the only ones that can have any influence on the progress of the disease.

Of course, it may be a satisfaction to some to know just what part of the lung is affected, and what form of consumption exists, but for all practical purposes this knowledge will avail nothing.

The principal, in fact, the only indication for medicinal treatment in this disease, is to build up and keep up the tone of the system at large, and it is to this end that all the drugs prescribed by the physician are directed. Realizing this, you will be prepared to believe that it will be better to receive this *toning up* from natural rather than from artificial means. So, then, the consumptive, or he who may have a tendency toward weak lungs, ought to observe in an especial manner the precepts of this book, and be very careful that he so lives as to impose as little work on his lungs as possible.

CHAPTER XVIII.

HOW A PERSON WITH HEART DISEASE OUGHT TO LIVE.

On this subject there is but little to be said that will be suited to the general public.

It would be useless for me to enter into a discussion of the various forms of heart disease; it would do you no good and would be unintelligible.

It will be sufficient to state that there are two forms of heart disease, two grand divisions; I might say, two ways in which the heart can deviate from a healthy state or condition.—

1st. MECHANICAL.

2d. ORGANIC.

1st. *Mechanical*.—By mechanical disease of the heart, I mean those conditions wherein the structure of the organ, its tissue proper, is normal, is not diseased, but where, owing to some cause, some portion of the heart is mechanically deranged, so that it is unfit to properly perform its duty.

These conditions are very numerous. I have already explained to you some little about the formation and duties of the heart; I will now go a little more into detail, in order that you may more thoroughly comprehend the necessity for the cautions I will have hereafter to give you.

The heart is truly and literally a double acting pump. It has the two properties of suction and propulsion.

Ordinarily this organ is about the size of the closed

fist. It is composed of muscular tissue, and consists of four cavities, all of which are connected by certain openings.

To make this clear to you, I will tell you first, that we have the *left ventricle* and the *left auricle*, the *right ventricle* and the *right auricle*. While this division really makes *two* hearts, each composed of a ventricle and an auricle, yet the different cavities are all connected by means of blood vessels, so as to form in reality but one organ. Now, let us follow a certain column of blood, and you can better understand the duties of the heart and blood vessels. Let us start with this blood in the left ventricle, and when we get back to our starting point you will understand how the blood gets into this cavity. The left ventricle contracts and the blood is forced out of it into the main blood vessel of the body, the *aorta*; the contraction is but momentary, since it occurs some seventy or eighty times in the course of a minute, and following this contraction comes a period of dilatation, in order that it may contract again; when this dilatation occurs, you would suppose that the blood just forced out would be drawn back again into the ventricle; but nature has provided against this regurgitation, by placing at the orifice of these openings little doors or valves, which immediately shut down, so that the blood cannot flow back.

When the next contraction takes place more blood is forced out, and this second column, pressing on that which has gone before, forces it further along, while its progress also is assisted by a contraction of the blood vessels themselves, whose walls contain muscular tissue, which enables them to contract, relax and contract again, just as the heart itself does.

So, then, the blood is carried along this large vessel, just as the passengers from a railroad train walk through the main hall of the depot and out on to the principal thoroughfare of the city. Just as these people now diverge into the different streets, to carry the life of business activity to the various portions of the city, so, in a short space this main vessel commences to give off branches to the various portions of the body, and into these branches the blood runs, in order that it may carry nourishment to these different parts. These vessels again divide and subdivide, each one losing so much of its own capacity as it has given to the new vessel, so beautiful are all the arrangements of nature, until finally they become small microscopical tubes, from which the tissues of the body derive their nourishment. These minute vessels are called *capillaries*.

After the blood has given nourishment to the parts, and has picked up the waste elements, as I have already described, it passes from these very small vessels into others equally small, but that are formed of a different tissue. These are called veins. The blood is now loaded with impurities, it is not now fit to nourish the body; it is foul, and must be purified. These little veins run together and form larger ones; these, again, coalesce and result in vessels of a still greater magnitude. By their agency the blood is carried to the various eliminatory organs or scavengers, where some of its impurities are removed.

After a while, these veins coming from all parts of the body unite to form two large vessels, which empty their contents into the *right auricle* of the heart.

From this cavity it is pumped into the *right ventricle*. From here it is forced through two large vessels or tubes into the lungs, where it undergoes the purification by oxygen about which I have told you, after which it is again returned to the *left auricle*, from which it is pumped into the *left ventricle*, in which cavity we first found it, and from which it is now once more ready to be sent out to nourish the body.

You now have an idea of the course of the circulation of the blood. It will, however, very naturally suggest itself to you, why does not some of the blood flow *backward*, in this constant onward course. That is precisely what it does do in some cases of disease, and it is just this danger that nature has endeavored to provide against.

To do so, she has placed at all of the openings little sentinels or doors capable of opening only in one direction. They will allow the blood to flow through in the ordained direction, but when it attempts to return they shut down, close the orifice and refuse passage to the fluid.

As long as these valves remain healthy, perfect circulation must take place; but, unfortunately, they are very delicate and easily deranged.

They may get out of order in several ways. The heart may become distended, involving in this distention the various orifices; when, of course, the valves will be too small to accurately protect them.

The valves may become diseased by the deposit in them of some of the atheroma I have told you about; which, making them rigid, will prevent their accurate adaptation to these openings. In various ways may

their competency be interfered with, and when this does occur, regurgitation of the blood will ensue. It will manage to get into some place where it does not properly belong; and this will constitute one of the *mechanical* forms of heart disease.

Again, the heart may become over-distended, while the openings may not be enlarged; therefore, the valves will be sufficient and no regurgitation will take place. But, if this distention or enlargement of the heart is not compensated for by an increase in its thickness, the strength of its walls becomes diminished, and the heart becomes *weak*.

In many cases where we have *dilatation* or stretching, we find hypertrophy or thickening of the walls; so that here, while the whole heart is enlarged, it is as strong as ever, and no evil consequences ensue. But, unfortunately, this is not always the case, and when the compensating hypertrophy does not occur, we have a *dilated* and *weakened* heart, which constitutes another form of *mechanical* derangement of this organ.

This brings us to *organic* disease of the heart as distinguished from mechanical interference with its action. These mechanical diseases are sometimes understood as organic, in contradistinction to functional or temporary diseases; but, to be accurate, we must call all disorders due to alteration in the make-up of the heart mechanical, while, when we come to those properly designated as organic, we must group under this head those derangements due to an alteration in the structure or composition of the tissue of the organ itself.

Prominently among these organic changes, we find

fatty degeneration. You already have a very fair idea of what this means. It consists in a deposit of fat in the walls of the heart, which, taking the place of the muscular tissue, renders the organ flabby and weak.

In other ways can the heart become diseased; but it matters not what may be the nature of the diseased condition, they all require the same care and prudence in living, in order that this weakened and diseased organ may be enabled to hold out and not succumb unnecessarily soon.

In all forms of heart disease the fatal result occurs from the same cause, namely, exhaustion of the vigor of this organ. It is true that in all deaths life ceases from this same cause; but in other diseases the failure of the heart's action is secondary to the primary disease; it is an effect and not a cause; while, when the heart itself is the seat of disease, this organ becomes the direct cause.

It will seem to you as only common sense when I say that any exertion of any kind will make a demand on the heart. Since you know that all exertion uses up some tissue in its performance, and since this tissue is repaired from the blood, and as the heart is compelled to pump this blood, so, then, you are prepared to understand how any exercise or exertion makes demand upon the action of the heart.

So, if the heart is weakened by disease, it becomes of paramount importance that you should reduce the demands made upon it to the minimum, else these unnatural demands will prematurely exhaust its diminished strength.

To accomplish this indication, you must, in the first

place, be careful to heed all the advice contained in the various chapters of this book. You must lead an even, equable, temperate life in everything.

You know how emotion of any kind, of joy, anger, grief, etc., will cause tumultuous action of the heart; therefore, any one who has disease of this organ should in an especial manner guard against these emotions. You all know that an old and leaky pump will answer its purpose well enough as long as it has but little work to do, but if you crowd it, if you give it suddenly an excessive amount of work, it will give out; it cannot adapt itself to the increased demand. So it is, precisely, with a diseased heart.

Now, I desire to say to those of my readers who may have heart disease, that the popular notion of the incurability of such diseased condition, and the belief that it will be rapidly fatal, and that death from heart disease always occurs suddenly, are all fallacious ideas.

In the first place, many forms of heart disease are curable; secondly, a person may live for many, very many years with an unsound heart; and thirdly, death is very frequently as gradual as from any other form of disease of any other organ.

But in order that a cure may be effected, or that life may be greatly prolonged, it becomes absolutely necessary that the precautions I have enjoined should be religiously observed.

The whole secret of hygiene in heart disease, the whole essence of this chapter, can be expressed in the few words, live quietly and evenly, never get excited, and never subject yourself to scenes and surroundings calculated to impress the emotions.

Here you have the whole question in small compass.

By leading this quiet, even, equable life, you will place very little strain on your heart ; it will go on, acting quietly and evenly, and will be vouchsafed time and leisure in which to recuperate its strength and to repair the ravages that disease may have made upon its structure.

For those who have heart disease, violent exercise will be especially injurious, since it will make upon this organ a demand altogether out of proportion to its ability.

I could tell you of a young man in our city who had developed his external muscles to a marvelous degree of perfection ; he was a fine looking specimen of a man, physically, but by this very development, by this excessive exercise, he had overstrained and diseased his heart. He was very fond of rowing. One day in the early spring he went out for a *pull* on the river. His shell was upset and he started to swim to shore. After a few strokes he disappeared beneath the surface and never came up. His death was reported as due to drowning. In truth, it was due to an excessive strain of a diseased heart.

His great exercise had diseased his heart, had rendered it weak and unable to meet and supply any great or unusual demand. By rowing he had added to this strain, and when he was thrown into the river, the sudden shock received from contact with the cold water, as well as the exertion put forth in endeavoring to swim to shore, proved too much for his diseased heart and it succumbed ; it could not meet the emergency.

From this case we learn the secret of how to live

when the heart is diseased, and the secret can be told in a few words.

It matters not what form of heart disease may exist, they all demand a quiet existence, in order that life may be prolonged.

Great exertion, either physical or mental, will be injurious, and must not be indulged in ; everything that is done must be done as quietly, slowly, and comfortably as possible.

By so doing, a diseased heart will last a long time, but by neglect of these precautions it will very rapidly give out.

CHAPTER XIX.

HOW A PREGNANT WOMAN OUGHT TO LIVE.

A woman with child should constantly bear in mind that she is fulfilling the noblest purpose of her existence. The Almighty Creator has bestowed upon her the wonderful ability to nurture and bring forth into the world His own children, made in His own image and likeness. She should ever remember that while carrying her child, marvelous and sublime phenomena are going on within her body. She should constantly feel the great dignity accorded to her by Almighty God, in His far-seeing wisdom and benevolence, and thus appreciating the wonderful changes taking place within her, changes so delicate, complicated and intricate in their nature as to be most profoundly impressed for weal or for woe by the slightest circumstances, she should guard her health and her general surroundings with the utmost solicitude and care.

A pregnant woman should be careful of her health and strength, because she has a life, a soul, within her, feeding upon her life, and inheriting to a degree the same amount of strength which she possesses. She should *eat well, sleep well, exercise well*, but MODERATELY. She should in an especial manner avoid all depressing surroundings. Every effort should be made to keep her always in cheerful and happy spirits. If it is important for the nursing woman to be gay and cheerful, it is doubly, aye trebly so for the pregnant one.

At the same time, too much anxiety, too much concentration of thought upon self, when in this condition, is unwise. To conform to the happy medium in everything should be the aim of the expectant mother. The same rules of life that are enunciated elsewhere throughout this book are eminently applicable to the pregnant woman, but in an especial manner are they necessary to one in this condition, since then her system is, so to speak, more impressionable, more susceptible to evil influences. By living carefully during this period of gestation, not only will more comfort be derived during its continuance, but the process of delivery will be rendered easier, while the subsequent restoration to health will be much accelerated. The heavy womb, daily growing larger and heavier, will, as you can readily understand, have a tendency to produce certain disordered conditions mechanically, so to speak, that is to say, as a result of pressure. Thus, by pressing upon the bowel which passes down behind the womb to terminate in the anus, it may form a mechanical impediment to the passage of excrement and cause constipation. Since regular, daily evacuations are so necessary to health, this condition should not be allowed to exist for any time. If the methods that I recommend in my little book on "CONSTIPATION" do not suffice to overcome this condition, you should at once consult your physician. Many pregnant women whose bowels are quite regular, yet suffer very much whenever they are moved. The suffering is sometimes so great that they will avoid the closet on account of it, thus cultivating a costive habit. In many cases this suffering is due to what might be called temporary

piles. The pressure, to which I have referred, of the heavy womb on the veins in the abdomen, so interferes with the circulation of blood in them as to cause them to become congested and enlarged, constituting piles. In the majority of cases this condition will pass away after the child is born ; if it does not, then it becomes a proper case for the physician. Again, by pressure on the internal veins of the abdomen, the free return of the blood from the lower extremities may be interfered with, while this extra pressure on the veins and on the column of blood in them, may force some of the water of the blood through the walls of the veins into the surrounding tissue, causing swelling of the feet and legs. If such a condition exists, you should, without delay, consult a physician, to ascertain whether this dropsy is due merely to mechanical pressure or is caused by disease of some organ, since in some cases organic disease may exist unsuspected, and prove a serious complication at the time of delivery, while if duly recognized and carefully watched by the physician who will attend you in labor, the danger to be apprehended from it may be very much lessened.

The pregnant woman must be particularly careful to avoid unpleasant or shocking sights and accidents, since it has been well established that not only will such depressing influences disastrously affect the mother, but also will they redound to the detriment of the child yet unborn. In this connection comes up the question of "*maternal impressions*," which is such an interesting and important one as to require a few minutes' consideration. There are innumerable instances on record that tend to demonstrate the fact that the child in the

womb can be influenced by impressions made upon the nervous system of the mother. Since undisputed *facts* are the best of arguments, I will convince you of this point by relating a few illustrative cases. These cases are given, not for the purpose of frightening pregnant women into taking care of themselves, but to show them what may happen from a disregard of well-known facts. Before detailing such cases it is but proper that I should issue a word of caution. It will be very wrong and injurious for pregnant women to misinterpret the meaning of my remarks and my illustrations; they must understand that such cases are very exceptional ones, and that the infinitely large majority of women are fortunately free from them; but what I desire to impress, is the fact that such misfortunes *can* occur, and to urge *all* women to carefully guard themselves against the *possibility* of such unfortunate occurrences. So, with this word of caution, and admonishing my female readers not to allow my illustrations to impress them otherwise than to make them careful to avoid shocking sights, and conveying this advice in an especial manner to those of a nervous temperament or disposition, I will proceed to give illustrations of the power of

MATERNAL IMPRESSIONS.

During the pregnancy of a woman, one of her sons got into a fight and received a knife wound across his wrist, severing the softer parts, to the bone; in this condition the boy was received and the wound dressed by his mother; and when the child was born, it had a like gash across its forearm, which resisted all efforts at healing, until finally it became necessary to remove

the hand and arm above the wound, when the stump readily healed.

A pregnant woman once saw an ugly ulcer or sore on the leg, resulting from a snake-bite; when her baby was born it had a similar sore on the same leg.

A pregnant woman once looked upon a man who had a horribly deformed eye; she was most profoundly impressed, and when her baby was born, an identical deformity of the eye was discovered.

Dr. W. J. Carter* relates the following: "Some years ago, I met a gentleman who resided near St. Cloud, Minnesota, who showed me the picture of a man upon his arm, the right arm raised over the head. His story was, that before he was born (his parents then living in an Indian country), an Indian suddenly appeared at the door of the cabin when his mother was alone, and greatly frightened her; he was a friendly Indian, as it happened, and threw up his arm in token of peace."

A case is reported where a woman had borne nine or ten children. When she was carrying the first child she happened one day to be at a neighbor's house, when one of the children came running in, crying, with an irregular, V-shaped wound on the forehead from the kick of a calf. Every one of her children at birth had a similar mark, which as time passed gradually faded and finally disappeared.

A truly remarkable case, showing how quickly these maternal impressions may be conveyed to and influence the child, is related by Dr. Ramsey, of Knoxville, Tenn.: "A negro woman belonging to my own household was about *seven months gone*, when she was

* Med. Brief.

thrown from a horse and fell in soft mud, with one leg, in its lower third, across a hay rod or sapling used to bind hay on a wagon. Twenty-four hours afterwards she miscarried. The child had a well-defined bruise on its leg, corresponding with the leg of the mother which struck the hay rod, and the leg of the child was broken, though no mark, even, was made on the leg of the mother."

Dr. Burchmore, of Illinois, reports the following case: He was called hastily to attend a woman in labor. She feared some deformity, since some time before she had become terribly frightened by seeing a man who had received a shocking injury to his thumb. When the child was born the thumb of the right hand was attached by only a slender filament of skin.

Dr. William Hunt, of Philadelphia, reports a very remarkable case that came under his observation at the Pennsylvania Hospital. A woman, thirty years of age and about eight months pregnant, was admitted to the wards suffering from extensive burns. Four days afterward labor came on and she was delivered of a dead child *that was blistered and burnt in extent and places almost exactly corresponding to the injuries of the mother.*

I could go on indefinitely multiplying illustrative proofs of maternal impressions on the child, but I have given you enough.

As an antidote to the possible effects that these recitals may have on some nervous and imaginative women, I will quote from Dr. Shivers, who says, "What a common experience it is with us to hear the mother

anxiously inquire, after the child is born, "*Is it all right,*" or "*Is it perfectly formed?*" and when the question is answered in the affirmative (as it generally is), "*Oh, I am so glad! for I was frightened by a cripple,*" or a snake, or a cow, or something. It is a belief among women, as firmly fixed as the belief in the deity, that maternal impressions during pregnancy, especially fright, necessarily affect the child; consequently every pregnant woman is on the watch, like a shying horse, for something to get frightened at; and such a something generally comes along, which, of course, she never forgets. Why, then, are children not more frequently marked?"

From the foregoing we are forced to two conclusions:—

1st. That maternal impressions are capable of and do influence the child in the womb.

2d. That this influence, in its unfortunate results, is comparatively very rarely manifested.

From these conclusions we can deduce the following advice to expectant mothers:—

Do not worry about the evil influence on your child of disagreeable sights or adventures that may have occurred unavoidably to you, but shun such occasions as far as lies in your power. Remember that in the large majority of cases they will do no harm, and bear in mind, likewise, that the less you concentrate your mind on them the less likely will they be to prove disastrous.

A very important matter in connection with the breasts during pregnancy is apt to be overlooked by all, save a very careful and cautious physician. Generally, in women pregnant for the first time, the nip-

ples are not prominent. As a result, when the baby is put to the breast, it finds nothing to take hold of, and grips and bites and worries, until it annoys itself into peevishness, and makes an exceedingly sore and sensitive nipple for its mother. If, now, during the last three or four months of pregnancy, you will, morning and evening, gently grasp the nipple between the thumb and forefinger and easily, gently and gradually pull it away from the breast several times, it will stretch like India rubber, since it contains much elastic tissue. By persevering in this habit (which a little practice will make perfectly clear to you), the result will be that when the baby is born you will have a prominent nipple, standing well out, which the baby can take hold of, without trouble or inconvenience to you or itself. Your fingers have intelligently and gently performed that which, otherwise, the baby's mouth would have instinctively but roughly been compelled to do, at the expense of much suffering and inconvenience. If you do this the first time, the suction of the baby's mouth thereafter will so permanently elongate and enlarge the nipple that the same procedure will be rendered unnecessary in future pregnancies.

Too much cannot be said against *tight lacing* in pregnancy. It will prove disastrous alike to mother and child. The womb is constantly growing, and so is the child. They both must have plenty of room to expand. Tight lacing will interfere with this free expansion, and by doing so, will force the unnaturally cramped womb to look for some other direction in which to expand. This it will do at the expense of the stomach, bowels, heart and lungs. Pressing thus on

these organs, it will interfere with their functions, and you will have dyspepsia, constipation, palpitation and shortness of breath. The natural enlargement of the womb presses upon and interferes with these organs sufficiently, without the additional artificial interference of tight lacing. Do not, therefore, I implore you, in the name of your poor, cramped and uncomfortable baby, sacrifice its future health and your own to the foolish dictates of fashion. What need you care, for the time, whether your waist has the circumference of a hogshead, so long as your health and that of your child remains unimpaired. And let me assure you, beyond any question of doubt, that it is a physical impossibility for a woman who resorts to tight lacing during pregnancy to bring into the world a perfectly developed and thoroughly formed child. Therefore, while it may be necessary in our day for women to wear corsets (since it would take a bloody revolution to do away with the abomination), though the Roman matrons of old needed no such artificial support, let them be laced only tight enough to give the actual support required, and not tight enough to reduce the circumference of the waist.

As an additional factor in removing this unhealthy constriction from the womb, pregnant women ought to wear their clothing suspended from the shoulders. The present style of supporting clothing from the waist, as you can understand, must exert a constricting influence on all the abdominal organs, and interfere with the free development of womb and child. Common sense will demonstrate this to you, therefore let your common sense direct you to remedy this trouble

by supporting your clothing where it ought to be supported.

To sum up, then, in a few words, the life to be led by a pregnant woman, it becomes plainly evident that the advice can be conveyed in a few simple words. When pregnant, the same rules of life are to be observed as would be applicable to one not pregnant, with the reservation, that during pregnancy the necessity for faithful observance of these rules becomes doubly imperative, since a pregnant woman is in many ways much more susceptible to evil influences than when not in this condition.

As an appendix to this chapter, I will quote the advice which Dr. J. Henry Bennett always gives to his labor patients, and the knowledge of which may save you much after suffering. He says, "On taking leave of my patient, I say to the husband: 'Your wife's confinement, being a natural function, ought to do her good: two months after it she ought to feel, at least, as well, if not better, than before the pregnancy. She ought to walk and stand as well, and to have no pains. If she does not attain this standard, send for me, and we will talk the matter over. During her confinement she may have received some internal injury, not appreciable at first, but easily recognizable later. Any such injury can easily be treated and cured a couple of months after confinement. If, on the contrary, it be allowed to continue untreated for months and years, it will undermine her health; and when she is at last forced to apply for assistance, it will prove most difficult to cure.'" This advice is sound and excellent, and it will be well for every pregnant woman to take it seriously to heart, and to act upon it.

CHAPTER XX.

HOW A NURSING WOMAN OUGHT TO LIVE.

The two cardinal points to be considered in the life of a woman giving suck to young are, first, to keep up the standard of her own health, and secondly, to maintain a copious supply of pure milk. These two indications are really one and the same, for, in the majority of cases, where the first is properly attended to, the second will follow as a natural consequence.

A nursing woman must ever bear in mind that her stomach must digest and furnish nourishment for two beings; hence it must be carefully attended to or both her own health and that of her offspring will pay the penalty.

She should consider herself, to a certain extent, in the light of an invalid, so far as exemption from fatiguing work and care of her diet is concerned. This constant formation of milk and its removal from her body is a constant drain upon her strength, and she should be vigilant to supply this drain by good, nourishing food, easy of digestion. The Roman Catholic Church exempts its members from abstaining and fasting when pregnant or when giving suck to young; to this ecclesiastical dispensation I would add the sanction of medical advice, and would say to any member of that church who may read these pages, that when pregnant or nursing, they are justified religiously and advised medically neither to fast or abstain. I would advise a

nursing woman, in addition to her regular meals, to drink three glasses of milk daily, unless it makes her bilious, when porter, brown stout, ale or beer might be substituted. When possible, and there is no fear of establishing a dangerous habit, the addition of a table-spoonful of *good* brandy and a little sugar to the milk, so as to make a punch, will be advisable. In some women milk will produce constipation; if so, this condition can generally be relieved by drinking a glass of *cold* water *immediately* before breakfast, and forming a regular habit of seeking the closet at precisely the same hour every day. If unsuccessful at first, persevere day after day, *at the same hour*, avoiding violent straining, and eventually a regular habit will be induced. Should this prove ineffectual, eat some oatmeal mush in addition to the glass of water before breakfast. If still unsuccessful, a medicated prune, obtained from a reliable druggist and taken at bedtime, may be tried. Do not eat fruit for this purpose when nursing a very young baby, unless you desire a wakeful night, with baby screaming in your ear, from colic.

If still constipated, call on your physician and do as he tells you. Let me beg of you, for the love you bear the baby at your breast, not to try all the medicines in a large and well stocked drug store, on your own responsibility, or the advice of that ever present friend who pretends to know so much and, in truth, knows as little or likely less of what she recommends than you do yourself. If you follow not my advice, if you do as so many women have done, particularly for this most troublesome and obstinate disorder of constipation,

mark my words well, you will regret your folly when it is too late, when you have become one of those hypochondriacal walking laboratories, who, by constant use of drugs, have bred such a tolerance of their action that you might as well pour warm water into an iron boiler and hope to melt it, as to produce any effect whatever upon their systems by the administration of any ordinary dose of medicine. I am not speaking from imagination; I am telling you facts. There are hundreds of such self-made women doctors, who have literally ruined their stomachs by the abuse of good and valuable medicines. I have seen some of them in whose stomachs you might almost explode a case of dynamite, without any appreciable effect, so callous had they become, from constant familiarity with the strongest and most potent drugs.

Now, my good lady, if troubled with persistent constipation, please take my advice, go at once to your physician, and if you do as he tells you and have patience, he will cure you. Your articles of diet must be carefully regulated; certain articles can be set down on the proscribed list, as almost sure to give the baby colic until he is three or four months old. Among these may be mentioned corn, new vegetables just in market, fruit and acid articles. Further than this, every case must be a law unto itself. If you suspect that any article affects your milk injuriously, eat freely of it; if it produces colic in the baby, or any other bad effect, let it alone for twenty-four hours. If the effects do not then appear, try it again; if after two or three trials you are satisfied that you have found the offending article, put it upon the proscribed list from that time forward.

You should abstain, as far as possible, from nursing your baby when you are over-heated, your milk is then feverish and may sicken baby; neither is your milk in condition to properly nourish when you are much fatigued, when you are depressed, melancholy or sad, when you are angry or excited. You should endeavor to preserve as even and quiet a disposition and temperament as possible.

The surroundings of a nursing, as of a pregnant woman, should be cheerful and happy. She should avoid sensational reading and exhibitions. Frights and shocks to her nervous system are injurious to her milk.

Should you feel very weak and languid, notwithstanding strict attention to your diet, you had better consult your physician as to the advisability of taking a tonic, but do not take one on your own responsibility. Should your dinner hour be later than mid-day, you had better take your punch, or porter, or brown stout, with a few crackers, or a piece of sponge-cake, about eleven o'clock. Take your second punch in the afternoon, and the third one before going to bed.

One of the greatest misfortunes that can befall a nursing woman is a gathered breast. This condition is generally due to the officiousness of monthly nurses. In its incipency, if properly treated, such a condition can generally be aborted; but these nurses, desiring to impress their patients with the profoundness of their knowledge, usually treat the early stages of a gathered breast themselves, concealing its commencement from the doctor, and only calling his attention to it when it has surpassed their skill, and when, generally, it is too late to prevent the formation of an abscess. There-

fore, I would advise all women who have any uncomfortable sensation whatsoever in their breasts, to request the physician, on his daily visit, to examine them, and not to trust to the nurse.

So, then, to sum up, nursing women, as pregnant ones, must pay attention, in a particular manner, to all those points that will conduce to maintain the standard of their health.

Before concluding, I must modify some of the statements contained in this chapter.

Occasionally, or I might even say frequently, women will suffer greatly from constipation after confinement, and all the means which I have recommended will fail to remedy the trouble.

To make such a case clear to you, and to illustrate the remedy, I will relate a typical case that occurred in my own experience.

A young married woman had given birth to two children, and from the date of her first confinement, had suffered terribly from constipation. It was the great exception when she had a natural passage from the bowels.

After each birth she was accustomed to drink freely of milk, so as to furnish plenty of nourishment to her baby; the babies thrived and so did the constipation.

Finally she became pregnant a third time.

She was constantly in dread of the trouble that she felt sure would succeed the birth, and her life was rendered miserable by the anticipation.

In time she was delivered of a large boy, and her worst fears were realized. Her constipation was something dreadful. The strongest medicines were

used; the contents of the bowels would come down to the anus, would there accumulate in hard masses of an enormous size, and she would be utterly unable to expel them.

Her sufferings at these times, when endeavoring to have a passage, were truly pitiable to witness, and certainly gave every evidence that they equaled the throes of labor itself.

After straining and suffering for maybe half an hour, it would become necessary for me to introduce my finger into the bowel and remove, piece by piece, these hardened masses.

Finally, concluding that medicine would do no good, this lady was told to abandon the use of milk, which it was considered had a constipating effect on her, to eat everything, to use plenty of water, to drink a bottle of ale at her dinner, and to seek the closet every day at the same hour.

To assist these measures, she was given a whole bottle of citrate of magnesia. The result of this advice was magical.

Within two or three hours after she had taken the magnesia, her bowels were so freely moved that she more than half filled an ordinary chamber, and from that day on she had daily a regular, full, free and comfortable evacuation from the bowels.

Her general health became much improved, her spirits became correspondingly elated, and, as she herself expressed it, she felt once more as she had felt before she was married. For five years she had suffered unnecessarily from constipation, and was now relieved.

She told me that her relief was so great that she was in the daily habit of making expressions of her gratitude.

Now, what effect did this freedom of diet have on the child? A most beneficial one.

This last was the largest child she had ever borne. Her milk supply was abundant, was of a quality to nourish him thoroughly, and *he did not have any more colic than the other children, when the greatest precautions in diet had been observed.* From this case we draw the following conclusion: That while, in the majority of instances, it will be better to restrict your diet, yet in certain cases, such freedom as was allowed in this case will prove beneficial to the mother and will not injure the child.

Remember, that the power of adaptability to circumstances is much greater in the infant than in the adult, and that while this freedom of diet may, for a time, produce colic and wakeful nights, yet, in a short time, the stomach and bowels of the baby will become accustomed to their action; while the effect of regular evacuations on the general health of the mother will be so great that it will redound to the material improvement of her milk, and thus to the better nourishment of the baby.

CHAPTER XXI.

HINTS FOR GOOD NURSING.

How often have we heard persons of all denominations heap blessings upon the heads of the devoted "*Sisters of Charity*," who, in time of carnage and bloodshed, during the prevalence of the most loathsome and fatal epidemics, at any and all times, are ready to sacrifice their own comfort, security, health, and oftentimes lives, to minister unto and nurse their fellow-creatures.

They make really a business of nursing the sick, and thus become very proficient; but since we cannot always command their services, and since good nursing is so important a factor in the treatment of disease, it becomes imperative that we should all know some little about it.

Truly can nursing be placed very high in the list of causes that tend to restore those ill to health; in many cases I would even place this ministry above that of the physician, since, oftentimes, good nursing alone will be able to turn the tide of chance in favor of the invalid, while in very serious cases the greatest professional skill, if not seconded by capable nursing, will be unable to do much.

To nurse well one must, first of all, be interested in the patient; it must be to a certain extent a labor of love, else it will be a failure. It is a well-known fact that when a physician practices medicine only for the

money he can make thereby, in the majority of cases he is unsuccessful. The duties of a doctor are so peculiar, they are so trying, and, in many instances, even, so repulsive, that unless he possesses a real love for his profession, he is very apt to perform them in a very slovenly and *half-cut* manner, which will not be conducive to success.

So it is with the nurse; his or her duties are oftentimes of such a nature that, unless actuated by more than money, by a higher motive, they are very apt to perform them but superficially, and thus to defeat the very purpose they are presumably endeavoring to accomplish.

Therefore, the very first requisite to make a good nurse is, that the person so employed shall feel a real interest in the case he or she is nursing. If the nurse is a member of the family, such interest will be a matter of course; but, if an outsider, it will be necessary to resort to the two following considerations in order to cultivate this interest:—

In the first place, you must consider how important is the position you are about to assume; you must realize how much is expected of you and how much you are capable of accomplishing.

And, in the second place, you must remember how very easy it will be to turn the balance, by neglect or improper nursing, so that one who would otherwise recover, may really be *killed* by unskillful nursing.

Many books have been written on nursing, and to such I would refer all who desire to prepare themselves as professional nurses.

My few hints herein contained will be mainly for

the guidance of those who may be called upon to nurse a relative or friend. The nurse owes to herself certain duties, as well as to the patient, and she must realize them.

If about to nurse some contagious disease, she must use all precautions to prevent herself from taking the disease. If smallpox, she must be vaccinated before taking charge. If some other contagious disease, she must be careful to thoroughly disinfect all discharges and articles from the patient, as recommended in the chapter on "How to Avoid Disease."

It should be an imperative rule, that no one in poor health shall undertake to nurse any case of sickness. Those whose health is bad, the tone of the system lowered, the vital vigor not up to the standard, are very much more apt to contract disease than are robust, hearty individuals, therefore, for this reason alone, such persons ought not to undertake nursing. But an additional reason is, that such persons, from their very weakness and ill-health, will be physically unable to properly care for the patient.

No one who may have any cause to worry over the sickness of the patient can make a good nurse. This worry will make him or her nervous and anxious, and the sick man, readily perceiving this, will become nervous himself, which can only tend to increase his illness and lessen his chances of recovery. Therefore, a nervous wife will make a very poor nurse for a sick husband, and vice versa; though if the wife can control her nervousness, no one can be better. Her love will suggest a gentleness of motion and a tenderness of sympathy that will do very much toward alleviating

the sick man's suffering, and producing that tranquillity of mind which is such an important factor in the recovery and restoration to health from so many of the more serious diseases.

Therefore, I would not advocate the employment of professional nurses where it is possible to find in the family some one who is capable, because of good health and an even temperament, of performing this duty as a labor of love. Such ministration will be gentler and more efficient than that of the most skillful and proficient professional nurse.

For the guidance of such amateurs I will enunciate a few directions.

To commence, you must realize that all the laws of health I have enunciated are in an especial manner applicable to one dangerously ill with disease, but in such cases the necessity for their enforcement becomes doubly imperative, since the sick man has less vigor than the one in health, and therefore is much more susceptible to the evil influences of bad sanitary surroundings. The nurse should be very careful and particular to scrupulously follow the directions of the attending physician, and that she may do so, it will be well for her to reduce his instructions to writing, so that she will have them ever before her, and will not be possibly betrayed into inaccuracies through a faulty memory. It will be wise to write these directions in the presence of the doctor, and reading them over, receive his approval of them, before he leaves the room.

I would recommend that in serious and protracted cases of illness, the nurse should keep a daily diary, in which is recorded every minute point about the patient; something after the following order:—

1. Nature and amount of food taken.
2. Effects of this food—whether vomited or retained—feelings of the patient after eating.
3. Number of passages from the bowels and their nature.
4. Amount of urine voided and its general appearance.
5. Character and amount of sleep—whether quiet and heavy, or light, dreamy and easily interrupted.
6. Record of time of giving medicines.
7. General condition and behavior of patient.

In addition to these few points, the physician will tell you of any others that he may desire you to note, and they can be included in the diary.

It would be well in very grave cases for you to learn how to feel the pulse and take the temperature (which the physician can instruct you how to do in a few minutes), and doing so every hour, or as the doctor may direct, to incorporate this in your daily report.

The temperature of the sick room must be carefully watched. Sudden or great changes will be terribly injurious to a very ill man or woman, and must not be allowed. Therefore a thermometer must be hung in the centre of the room, away from a window or door, and about the height of an ordinary man's head from the floor, say between five and six feet.

Unless under special instructions from the physician, the temperature should never be allowed to exceed 70° nor to fall below 68° F. If the room is heated by a stove, you should endeavor, as far as possible, to put coal on when the patient is awake.

If this is impossible, or if the sick man is very nervous

and is disturbed by the slightest noise, each piece of coal should be wrapped separately in soft paper, and laid gently and noiselessly on the fire with the hands.

It would be much better for all sick-rooms to be heated with stoves, grates or open fire-places than from the cellar furnace, because the former will thoroughly ventilate the room; by allowing a free exit for the *foul*, they will secure the entrance of a sufficiency of *pure* air; therefore, while they are preferable in *all* portions of *all* houses, at *all* times, they become doubly so in the invalid chamber.

A very important point in connection with nursing the sick is "*bed-making*." The nervous susceptibility of any one when ill is greatly exaggerated and intensified, and what would seem as but insignificant trifles to a person in health, become serious and dangerous to the invalid. The bed-clothing upon which the patient lies, *i. e.*, sheet, etc., should be always smooth; you must be careful not to allow crumbs from the meals to accumulate in the bed; they will annoy and irritate the body, and by so doing will unfavorably influence the mental state, and through it react to the detriment of the physical welfare of the individual.

Where the nature of the disease will permit, the bed should be thoroughly made over every day, so that the sheets, etc. may be subjected to the purifying influence of the air; where this is impossible, the bed should, at least, be "*tidied up*" each day. It is wonderful what a refreshing and beneficial influence attention to these little details will have on an invalid.

The pillow should be frequently turned. The poor sufferer, tossing with fever, with the head hot and

bursting, will soon heat the pillow so that it will become very unpleasant. The under surface is cool and refreshing; turn it, and let the weary, aching head have a few minutes' comfort on the cool side, and when it becomes hot, turn again, and so on.

To make a good nurse, you must have judgment; to do anything properly, one must have judgment. There are very few universal rules that can be enunciated as without exceptions. In this small matter of pillow-turning, as in all the details of nursing, you must act with discretion. If the frequent disturbances necessary to change the pillow whenever it becomes warm seem to annoy and exhaust the patient, then you ought not to do so.

If, on the contrary, the patient desires, and seems more comfortable after them, then you can rest assured that they are beneficial. Since cleanliness is such an important factor in the preservation of health, you will be prepared to believe that it must have a great influence in restoring those to health who are sick.

And so it has. It is even more important for sick persons to be washed regularly and frequently than for those who are in good health.

Therefore, nurses must consider the daily washing of their patients as one of their chief duties, unless it has been interdicted by the physician.

But a certain amount of caution must be exercised in this washing. The face, hands and feet ought to be washed every day, while it will only be necessary to wash the entire surface two or three times a week. When the time comes around for this general washing; you must not expose the whole surface of the body at

once, because, remember that the sick man is very weak, and is much more likely to *take cold* than one in robust health.

Expose only one limb or part of the body at a time, and with a soft old rag, and soap and water, wash it gently and thoroughly dry it, and go on to another part, until you have thus washed the whole body.

If the patient is very weak, it will be well after this washing to anoint the whole surface with alcohol; this will be absorbed by the pores of the skin, and will tend to strengthen and give tone to the weakened body. The following formula will make a most agreeable and satisfactory mixture for this purpose, and will tend to greatly refresh and invigorate the body. It may also be used with advantage on the young baby after its daily bath.

You should pour some of it into the hollow of your hand, and rub it well into all parts of the body.

Alcohol,	-	-	-	-	-	-	-	-	-	1 pint.
Rose Water,	-	-	-	-	-	-	-	-	-	$\frac{1}{2}$ "
Water,	-	-	-	-	-	-	-	-	-	$\frac{1}{2}$ "

When you know that medicines or *drugs* do not really *cure* disease, that they only *help* nature to work a cure, you are prepared to understand how anything that will favorably impress the forces of nature in the individual will tend to promote recovery from disease. Every one, in health, has experienced the delightful and refreshing sensation produced by a bath; how much better and stronger they have felt. Thus, then, they can understand how beneficial will be this bath, and particularly the tonic influence of the alcohol rubbing, on one in a weak and debilitated condition.

It is equally as important that the body clothing of

invalids should be frequently changed. It will do but little good to wash them, if soiled clothing is put back on their clean bodies. The clothing should be changed at least as frequently as in health, unless the condition of the sick person is so very precarious that the slight exertion necessary to effect this change would be sure to prove very disastrous. Any slight amount of fatigue will be more than counterbalanced by the refreshing influence of the bath and clean clothing.

Dr. Domville gives the five following valuable rules for the guidance of nurses when changing the patient's clothing :—

1. Never begin to change until you have *all* you are likely to require *ready*.
2. Be careful that there is no draught on the patient from some open door or window.
3. Let the fresh linen be properly aired and warmed beforehand.
4. Do not move or uncover the patient more than is absolutely necessary.
5. Do not let the patient help too much, and, on the other hand, take care that they (male patients especially) do such things as they can and ought to do for themselves.

It is very important that sick persons should be properly fed. While as a general rule the nurse ought strictly to follow the directions of the physician in this respect, yet there are certain cases in which the judgment of an intelligent nurse can be productive of very much good in this matter of feeding.

Old Professor Samuel Jackson, who, many years ago, stood at the head of the medical profession in this city,

used to tell his classes of a case of brain fever in a lady patient of his. She was very ill, in fact, she was given up for death ; her case was considered hopeless. She could eat nothing, and was almost all the time unconscious. Being unable to eat, she was reduced to the last extremity of weakness, and her family stood around waiting for death.

Finally, during one of her intervals of consciousness, she asked for some *corned beef* and *cabbage*. Dr. Jackson, whose practical and logical mind has seldom been equaled, said she could have it. It was prepared, and she was allowed to eat all she desired. From that minute an improvement in her condition commenced, and she was soon well.

From this, as well as from many similar cases in my own experience, I am led to conclude that, unless there are some very strong reasons against it, a sick person who has but little appetite should be immediately indulged in anything he or she may happen to crave.

In the majority of cases this craving is the voice of the weakened system asking for something that it requires, and if it receives it, the chances are the stomach will digest it, and will furnish strength and nourishment to the body that will enable it to successfully combat and resist the exhausting influences of the disease.

When the doctor so directs, the nurse should be very particular not to allow the patient to leave the bed to have the bowels moved or to pass water; some nurses and many patients fail to carry this out; the first, on account of *laziness*; the latter, because of the discomfort of having passages in bed. But I must tell

you that the uncertain tide, in many serious cases, has been turned into a fatal channel by the exhaustion caused by the muscular effort of getting out of bed to attend to the calls of nature.

The nurse must ever bear in mind the fact that when a person is seriously ill from disease, the whole body, every organ and every function, is very weak; their ability to act and maintain life is very precarious, their vigor is much lessened; therefore, they must be nursed very carefully, and their strength scrupulously conserved, else they will give out; the vital spark will be extinguished, and death will occur in cases that *ought* to get well.

To make this point familiar and intelligible to you, I will make a rude comparison:—

When, on a windy day, you strike a match, great care is necessary to protect the flame from the wind; in the majority of cases, the air will extinguish the commencing fire, as every smoker will bear evidence who has endeavored to light a cigar on a windy day. But when the match has become well lighted, when the flame is strong and vigorous, you can expose this same match to the full force of the wind, and the flame will only burn the brighter; it will now seem impossible to extinguish the fire.

The man in robust health can be compared to the match in full vigor. Exposure, exercise and the ordinary duties of life, will have no evil influence on his full vital strength; while the invalid can be appropriately likened to the match just starting into flame. Both must be carefully nursed, else the ordinary forces of nature will prove too much for this weakened and

flickering flame of life, and it will be extinguished unnecessarily soon. If you carefully nurse and nurture the weakened forces of the invalid, he will grow in strength as does the flame of the match, until, by degrees, he will once more attain that degree of vigor that will enable him to successfully resist the very influences that would prove disastrous to him in his weakened condition.

When using bed-pans, for the purpose of receiving passages from the bowels or urine, it will be well always to thoroughly disinfect them after use. This can be accomplished by washing them well with one of the disinfectant solutions recommended in the chapter on "How to Avoid Disease." After such washing, it should be thoroughly dried and laid away for the next time.

Remember what I have said about the influence of decomposing organic material in producing disease, and realize that any little specs of matter from the bowels or bladder that may adhere to and be allowed to remain in the bed-pan will decompose, and may thus become the source of a poisoned atmosphere, the inhalation of which may and will do much toward retarding the recovery of your patient.

If the disease you are nursing happens to be contagious or infectious, it will be well for you to frequently wash your own body with some disinfectant. For this purpose, I would recommend carbolic soap. You can frequently wash your hands with this soap, and it would be well if you could make the time, once a day, when your patient is asleep, to wash your whole body with the same, being careful not to get the soap in your eyes, because it will irritate and make them sore.

By following this advice and using the precautions for disinfecting your clothing already recommended, you will constantly destroy the disease germs as fast as they form, and while thus affording protection to yourself, will at the same time reduce to the minimum the danger of carrying the disease away with you and spreading it abroad.

It will sometimes be necessary and advisable, in obscure cases, to have a post-mortem examination made, to determine the cause of death, when it has been impossible during life to ascertain the nature of the disease.

When such is the case, the nurse ought to have ready, in the room, some hot and cold water, sponges, plenty of towels, and a couple of empty pails; the doctor will supply the balance.

SICK-ROOM COOKERY.

Since diet is a very important consideration in the care of the sick, than which none other holds a higher rank, it is well that those nursing should know how to properly prepare food for the invalid.

Many good cook-books have been written, which detail the preparation of food for the sick, therefore, I will confine myself to giving you directions how to prepare the most commonly ordered nourishment.

MEAT JELLY.—Take one pound each of rump steak and lean mutton, cut up very fine and put into a jar; cover over or tie down tightly, place the jar in a saucepan half full of water, and let it stand three hours on the fire; then press the meat through a sieve, and add to the essence half an ounce of isinglass dissolved in a quarter of a pint of water; when cold take off the fat.

PORT WINE JELLY is made by dissolving half an ounce of isinglass in a wineglassful of water, with a couple of lumps of sugar, in an oven or over a gentle fire; then add five wineglassfuls of port wine, and stir continually for ten minutes; strain through muslin, and pour into a mould moistened with a little clean cold water, and set aside to cool; a piece the size of an egg may be taken two or three times a day. If desired, a little nutmeg or cinnamon may be grated into the wine before adding it to the isinglass.

BEEF TEA may be prepared in two ways, but the preparatory stage is the same in both; the beef should be finely divided, and all fat should, if possible, be removed; it should then be placed in a jar containing cold water, in the proportion of one pound of beef to one pint of water; let the jar stand for an hour; then place it either in an oven, or if this is not practicable, in a saucepan half full of water, and let the water in the saucepan gently boil for another hour; then strain through muslin and flavor according to taste. Beef tea may be rapidly prepared by placing the jar containing the meat, finely divided, without any water, in an oven for twenty minutes; then add boiling water, according to the quantity required.

MUTTON BROTH.—The lean part of necks and loins should be chosen, be cut up into small pieces, and all superfluous fat should be removed; about one pound of neck of mutton thus prepared should be placed in a saucepan containing a pint of cold water, and placed on the fire, and as the scum rises to the top it should be carefully removed; when this ceases, let the broth boil for about two hours; strain and flavor. A tea-

spoonful of pearl barley, added when the broth begins to boil, will often prove an agreeable addition.

CHICKEN BROTH is prepared by immersing the chicken in cold water in a saucepan, and letting it boil for two hours, skimming off the fat that rises to the surface.

CHICKEN PANADA is made by rubbing together in a mortar the meat from the breast and wings of a roast or boiled chicken, with an equal quantity of stale bread; then add gradually the water in which the chicken was boiled, or other broth; boil for a few minutes and rub through a fine sieve.

BEEF TEA CUSTARD.—Beat up the white of one egg with the yolk of two, with a little salt, add a small wine-glassful of beef tea, strained through a cloth, mix, and pour the mixture into a pot, lightly buttered, tie it over and set in a pan of boiling water, taking care that the boiling water in the pan is as high as the contents of the jar.

CALVE'S FOOT JELLY.—Thoroughly clean two calves' feet, cut into pieces and stew in two quarts of water until reduced to one quart; when cold, take off the fat, and separate the jelly from the sediment. Then put the jelly into a saucepan, with white wine and brandy, and flavoring to taste, with the shells and whites of four eggs, well mixed together, boil for a quarter of an hour, cover, and let it stand for a short time, and strain while hot into a mould through a flannel bag.

BARLEY CREAM.—Soak an ounce of pearl barley in cold water for two or three hours; take half a pound of veal cutlet, pounded to a pulp, and rub through a sieve with the barley; then boil with two or three tablespoonfuls of cream.

BREAD JELLY is made of stale bread steeped in boiling water, and then rubbed through a sieve or piece of muslin, flavored with sugar or salt, according to taste, and set aside to cool.

HOW TO COOK AN EGG.

1. *Simple Boiling*.—Set a saucepan nearly full of water on the fire, and when the water boils, put the egg in with a spoon and leave it from two to three minutes.

2. *Poached*.—Put a tablespoonful of salt into a saucepan full of boiling water; then break the egg carefully into it and let it boil gently for three minutes; then take it out with a large spoon, set it on a plate to drain and serve on toast.

3. Break the egg into a cup, then stir the water in the saucepan rapidly round with a stick, and as it is whirling, drop in the egg, and let it revolve for three minutes, then serve on toast.

4. *How to Make Omelettes*.—Place a good-sized piece of butter or lard in a clean frying pan, and while it is dissolving break the egg or eggs, according to the size of omelette required, into a cup containing two dessertspoonfuls of milk for each egg, and mix them well together with a fork, adding the flavoring, sugar, or salt, pepper, parsley, etc., as required, and when the fat is hot enough pour the egg-mass into the middle of the pan, and keep up a constant, though gentle agitation of the pan all the time, for about five minutes, to prevent the egg-mass from sticking to the bottom, then roll it together like a pancake.

5. *Snow Eggs*.—Take a small tea-cup of new milk, and boil it in a small, shallow saucepan, with a little sugar; while it is boiling break the egg, putting the

yolk and white in separate cups, whip up the white to a fine, light froth, and when the milk is quite boiling, take of the white, a large spoonful at a time, place it on the top of the milk for a moment or two, then turn it, and when sufficiently solid lift it out on a broad, flat spoon or *slice*; then mix up the yolk with some sugar, add the boiling milk, mix, and boil again for a few minutes, then pour around the white and serve.

BRANDY MIXTURE is made by beating up an egg (or the yolk only, if it is desired to make it lighter) with some sugar, then gradually add a wineglassful of cold water, stirring carefully all the while, and then a wineglassful of brandy.

WHITE WINE WHEY is made by adding a wineglassful of sherry to half a pint of boiling milk, and then pour the resulting curds and whey on a strainer and serve hot.

TREACLE POSSET.—A tablespoonful of treacle takes the place of the sherry, and a little additional boiling is required.

OATMEAL GRUEL.—Mix two tablespoonfuls of oatmeal, very smooth, in a little cold water; then add it gently to half a pint of water; put it on the fire, and boil for a quarter of an hour, stirring constantly; then flavor with lemon peel, sugar, nutmeg, etc., according to taste, and strain through muslin while hot.

SAGO requires to be soaked a little while before using; an ounce should be placed in a pint of water, and stood on the hob, or in the oven for two hours; then boil for a quarter of an hour, and flavor to taste.

ARROWROOT may be prepared with either milk or water; if it is desired to add wine or brandy, water is preferable.

Mix a dessertspoonful of arrowroot with a little *cold* water or milk, in a cup, then add half a pint of *boiling* milk or water, stirring all the time.

ARROWROOT PUDDING.—Add yolks of two eggs to above, with a teaspoonful of powdered white sugar, mix well, and bake in a lightly-buttered dish for ten or fifteen minutes.

CUSTARD PUDDING.—Break an egg into a cup, and mix thoroughly with sugar; then add milk to nearly fill the cup, mix again and tie over with a small piece of linen; place the cup in a shallow saucepan, half full of water, and boil for ten minutes. If it is desired to make a LIGHT BATTER PUDDING a teaspoonful of flour should be mixed in with the milk before tying up.

RICE BLANCMANGE.—Simmer half a pint of milk with a tablespoonful of pounded white sugar until near boiling; then stir in two ounces or one large tablespoonful of ground rice, previously mixed with half a pint of milk, till smooth; boil for ten minutes, stirring all the while, and pour into a moistened mould and serve it cold.

CORN FLOUR PUDDING.—Take one pint of milk, and mix it with two tablespoonfuls of the flour; flavor to taste, then boil the whole eight minutes; allow it to cool in a mould, and serve with or without jam.

LEMONADE.—Pare a lemon very thin, and remove as much as possible of the white substance underneath; then cut it into thin slices, and put them, with the parings of rind, into a jug with some white sugar; then add a pint of boiling water, let it stand till cold, strain and add ice.

IMPERIAL DRINK is made by dissolving a drachm of cream of tartar in the boiling water added to the lem-

onade as above. This preparation can be kept on hand and used freely in warm weather by those who suffer from the heat, and who feel dry and hot. By drinking it freely the action of the kidneys and skin will be promoted, and thus much of the superfluous heat will be removed.

BARLEY WATER.—Take two ounces of pearl barley, and having twice washed it in cold water, boil for twenty minutes in a pint and a half of water; strain and flavor with lemon peel and sugar to suit taste.

TOAST WATER.—Take a slice of stale bread or bottom crust of loaf, toast it carefully without burning, put it in a jar, and pour over it boiling water; let it stand to cool.

LINSEED TEA.—To half an ounce of unbruised linseed, with a drachm of liquorice, in a covered jar, add a pint of boiling water; let the infusion stand on the hob or near the fire for three or four hours; strain and flavor to taste.

RICE WATER.—Wash an ounce of rice in a strainer, with cold water; then put the washed rice, with an inch of cinnamon stick, into a stewpan with a pint of boiling water; boil for an hour, then strain and sweeten to taste.

APPLE WATER.—Take six peeled apples, quarter them, and take out cores and pips; then cut into thin slices, put them, with the rind of half a lemon, cut very thin, and an ounce of loaf sugar, into a jar, pour on a quart of boiling water and let it stand to cool.

It is more important than one would at first suppose, that a nurse should have some knowledge of sick-room cookery; because very often the physician will say, "*keep the patient on low diet;*" the majority of persons

do not know what this means. It means food prepared according to the formulas I have given. Very few persons know how to make beef tea or broths properly; by keeping this book near you and referring to this chapter, you can be accurately guided in this most important question at any time.

In conclusion, I will impress upon nurses the necessity of being quiet in a sick-room. You should wear slippers and move about with as little noise as possible; remember that the nervous system of an invalid is in an abnormal, a very excited condition, and will be injuriously influenced by causes and noises that would have no effect whatever on one in health.

Do not carry on long and loud conversations; if it is necessary to say anything, say it and be done with it, but do not use any unnecessary words.

Avoid *whispered* conversations; they annoy and irritate the sick person, who imagines that you are talking about him, and strains his faculties to endeavor to catch what you are saying. Sick men and women, particularly if they are dangerously ill, are very suspicious, and when they see persons talking together in a whisper, are very apt to imagine that the nurse is telling the others how very ill he or she is, and this idea worries and annoys them.

I once knew a nurse (she was a female professional nurse) who in the evenings would sit on a rocking chair and rock, and rock, cracking her toes the while, until she succeeded in making her patient so nervous that sleep was impossible.

Therefore, in addition to what I have said before, the nurse must be particularly careful to do everything quietly, and not to make any unnecessary noise.

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